

The Iron Age

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Indiana's Gas Fields.

The gas field of Indiana, so far as it has been developed, is confined to an area 60 miles long from east to west, and 20 wide from north to south. The strongest wells seem to be in the western half of this area. The northern line stretches from Kokomo on the west to Portland on the east, and the southern from Noblesville to Winchester. The greatest flow of gas is found at Noblesville and Anderson, with magnificent wells at the intervening points of Fairmount and Jonesboro. Within the area mentioned there are now 30 wells in operation, as follows: Noblesville, two; Kokomo, four; Hartford City, one; Portland, three; Winchester, two; Muncie, seven; Anderson, Fairmount, Alexandria, Ellwood, Eaton, Pendleton, and Jonesboro, one each, and Marion, three. Each of these places is boring additional wells, while boring is also going on at Red

very pungent odor that is anything but pleasant, but this is a good feature, as it will enable leaks to be detected easily.

At Portland, Winchester, Muncie, Marion, Noblesville and Kokomo, the gas is being utilized. At the other points it is being burned for show. The first successful well is the one at Eaton, and it has been burning for about six months. This well was first bored in 1876, the operators prospecting for coal and not for gas. The hole was only 2

Mississinnewa, but boring is going on north of the river. Marion is the furthest point north at which gas has been found, and Winchester the furthest south. The wells at Winchester are weak. Kokomo is the furthest point west. Winchester is the highest point above sea level, it being 1089 feet, and Noblesville is the lowest point, being only 770 feet. At Winchester oil rose in the wells to a height of 75 feet and at Portland to 125 feet. The oil was of a very

was made to pass through this, but failed, after an expenditure of some \$200,000. To sink this shaft the pipes would either have to be put down the entire length at the start, or it might be better to build the upper portion of the shaft so large that near the ends of the first set of pipes put in an offset could be made, through which a second set could be inserted.

Otto Gas Engines at the Coblenz (Germany) City Water Works.

Messrs. Schleicher, Schumm & Co., proprietors of the Otto Gas Engine Works, at Philadelphia, Pa., have favored us with some interesting information relating to the pumping station of the city water-works at Coblenz, Germany. These are driven by 50 horse-power Otto twin engines, and present a very striking example of the rapid

pumps in a water-tight pit. Of the two plans worked out and presented by Mr. Grahn the one used steam and the other gas as a motive power. The cost of both plants was nearly alike, but the steam engines would have necessitated deep foundations and more buildings, and the difference in first cost to the city would have been about \$17,500. Outside of this, it was argued that the city owning also the gas-works, which were only half a mile distant from the station, would be able to charge the gas at cost to the water-works; that the plant at the gas works would require no additions to make the gas consumed at the pumping station, and that the variation in the consumption of gas from summer to winter, and from day to night, would be largely reduced. The height of lift is 193 feet above water-mark, the highest house in the city being not more than 122 feet high. The reservoir is about a mile from the pumping station,

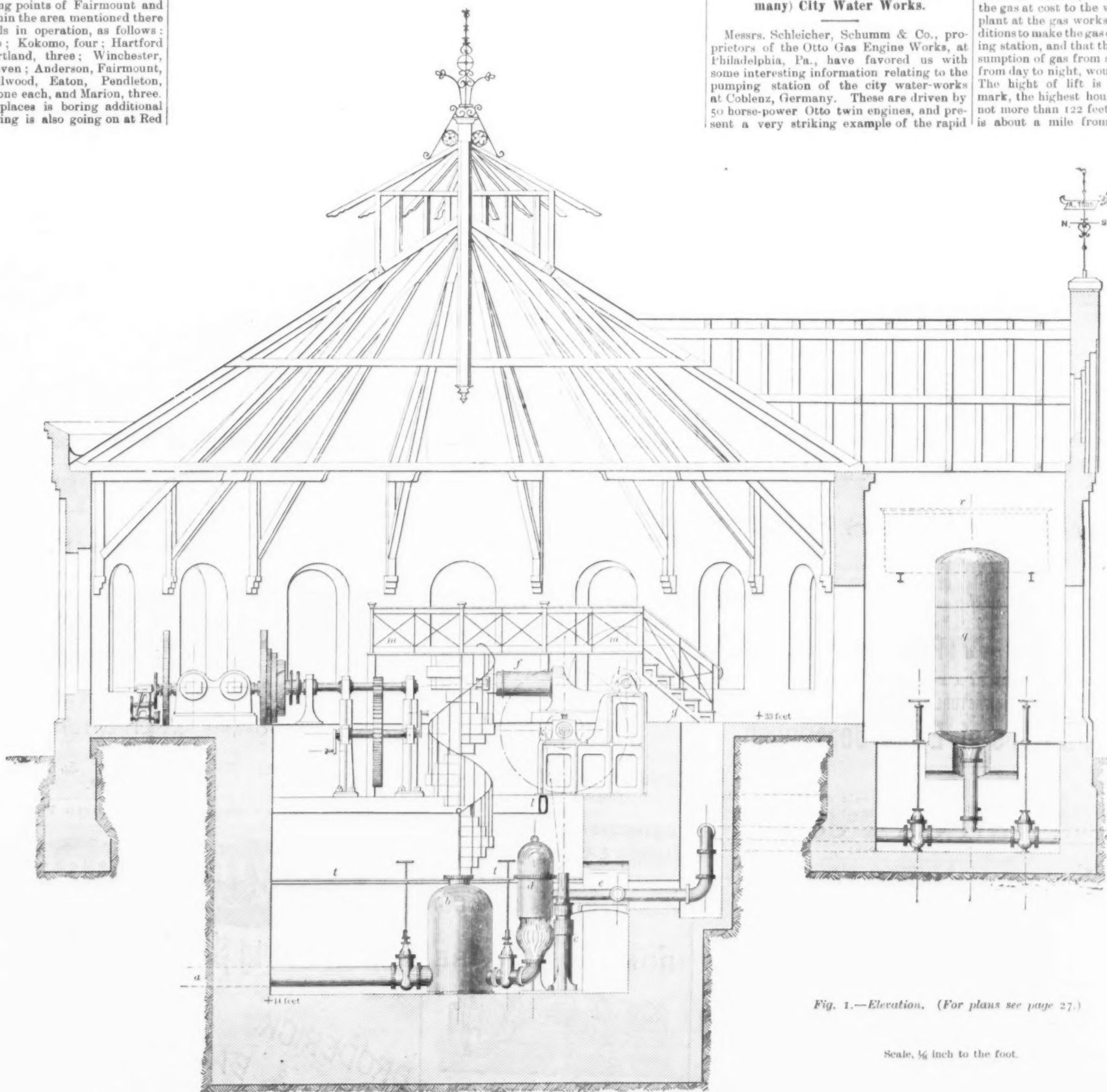


Fig. 1.—Elevation. (For plans see page 27.)

Scale, 1/4 inch to the foot.

WATER WORKS AT COBLENZ, GERMANY, DRIVEN BY THREE OTTO GAS ENGINES OF 50 HORSE-POWER EACH.

Key, Ridgeville and Dunkirk. Except at Portland and Tipton every well in the mentioned area has furnished gas. At Portland four wells were failures. At Tipton two trials have been made, both ending in disappointment. In Darke County, Ohio, or its immediate vicinity, rise three rivers which flow through Indiana: The Wabash, White, and Mississinnewa. All the gas has been found between the Wabash and White Rivers. The four strongest wells are at Noblesville, Anderson, Fairmount and Jonesboro, and they stand in the order named. Kokomo has the best group of wells. The wells range in depth from 865 feet at Anderson to 1090 feet at Winchester. At Anderson, Muncie, Winchester, and Hartford City, Trenton rock was reached above sea level. At the other points it was not found until the drill had gone below the level of the sea. Some of the wells give out water as well as gas, while others are dry. The water, however, in each instance comes from a point above the bottom of the well. The gas from all the Indiana wells has a

inches in diameter. At the depth of about 600 feet a vein of gas was struck, which burned a flame 2 feet high. The well was then abandoned, the projectors thinking nothing of the gas. When the excitement about the gas find at Findlay, Ohio, got up, the owners of the Eaton well took a notion that they had been neglecting a bonanza, so drilling was again begun. At a depth of 890 feet, or 5 feet below sea level, Trenton rock was reached. The boring was continued into the rock 32 feet, when a magnificent flow of gas was obtained. The next well to furnish gas was at Kokomo, the depth being 918 feet, of which 30 feet is Trenton rock. Kokomo wasted no time, but at once began piping the gas into the city for practical use. Since then three other wells have been sunk and each furnishes gas in almost limitless quantities. Two of her wells are about a mile and a half apart, showing that the gas field extends on all sides of the town. There is less than 6 feet difference in the depth of the wells. At Marion the three wells are all south of the

superior quality, but the quantity was too limited to be utilized. Each of the two wells at Tipton also showed oil. The first well at Portland was bored to a depth of 1440 feet and ended in a failure. The deepest hole, however, is at Bloomington, Monroe County. It is 2730 feet deep. Water was what they were after. No gas, oil or coal was found, but a small supply of sulphur water was obtained. This is the deepest artesian well in the world. The depths of the other famous wells are as follows: Grenelle, France, 1797 feet; Passy, France, 1923; Kissingen, Bavaria, 1878; Charleston, S. C., 1250; St. Louis, Mo., 2199, and Louisville, Ky., 2086.

According to Mr. W. Sooy Smith, an early application of the new Poetsch freezing process is likely to be made in sinking a shaft to a bed of sulphur discovered several years ago in Louisiana. This occurs at a depth nearly 500 feet below the surface, and to reach it beds of sand have to be penetrated in which the head of water is 300 feet. An effort

development in the gas engine line. The main facts concerning the plant were given a short time ago by Mr. E. Grahn, city engineer at Coblenz, in a paper published in the *German Gas Light Journal*, and from this the following particulars have been taken:

The pumping station of the water-works of the city of Coblenz is located on the island of Oberwerth, in the river Rhine. It is designed to supply on an average a little over 1,000,000 gallons per day, the maximum consumption being about 1,250,000 gallons. The water is taken from the bed of the Rhine by two wells sunk water-tight down to 16 feet below the Coblenz water-mark. They are 10 feet in diameter and about 500 feet apart, some 150 feet from the water's edge. The pumping station stands in the middle between the two wells, and the suction pipes running to it are 16 inches in diameter. They run in concrete ducts, which are accessible everywhere. As the level of the water varies as much as 27 feet, it has become necessary to countersink the

and contains 700,000 gallons in three sections. It is built on a concrete foundation, with brick laid in cement. As the military authorities wanted it to be entirely concealed from view, so as not to offer a target for the enemy in case of siege, it was arched over, and covered in some places with 8 feet of ground.

The work of pumping is done by two Otto gas engines of 50 actual horse power, a third one being there only as a reserve in case of accident. The floor of the engine room is 30 feet above water-mark, and the ground plan of the room is a circle of 50 feet in diameter. The pumping pit is in the center; its diameter is 20 feet and the bottom is 14 feet above water-mark. Around the edge of this pit stands the three engines under angles of 120°. The engines are twin engines and make 140 revolution per minute. The crank shafts of the engine and the geared shaft of the pumps are connected by friction couplings. The gearing is 5.25, so

(Concluded on page 27.)

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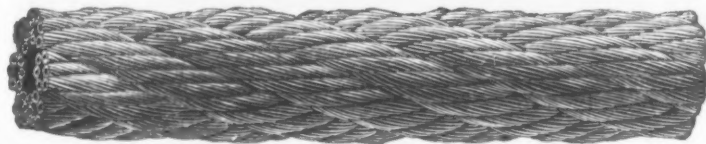
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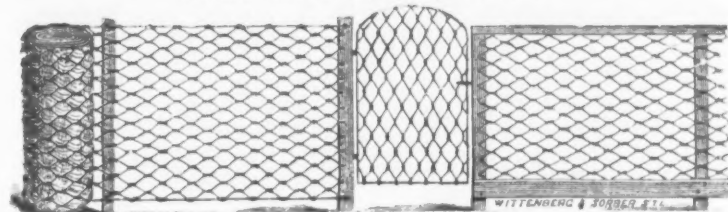


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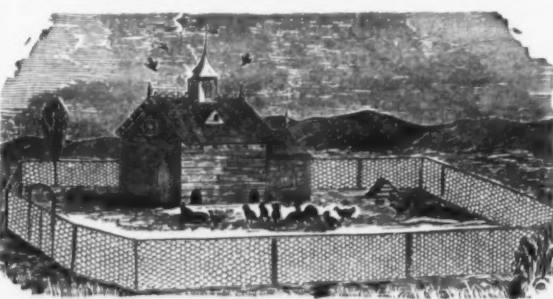
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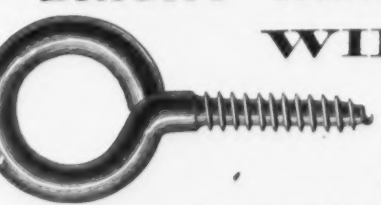
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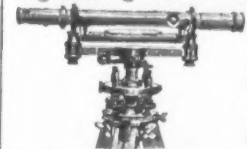
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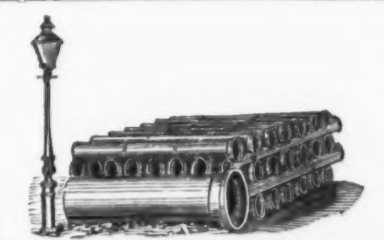
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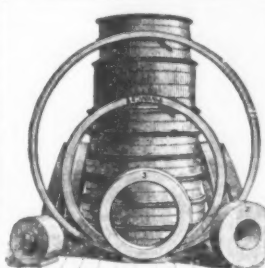
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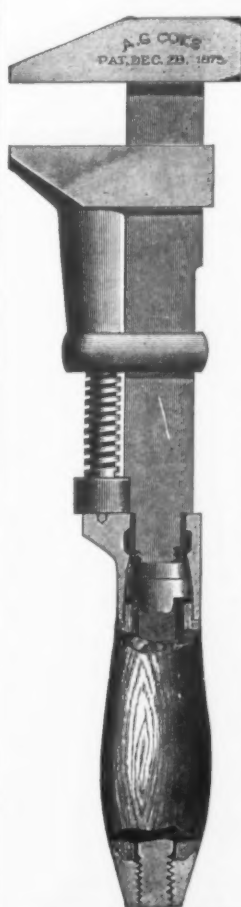
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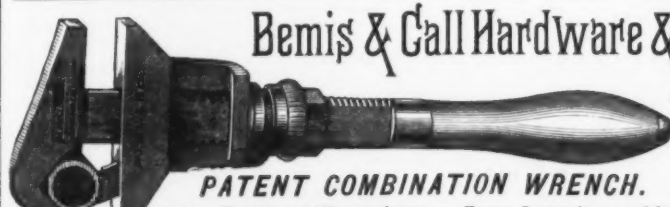
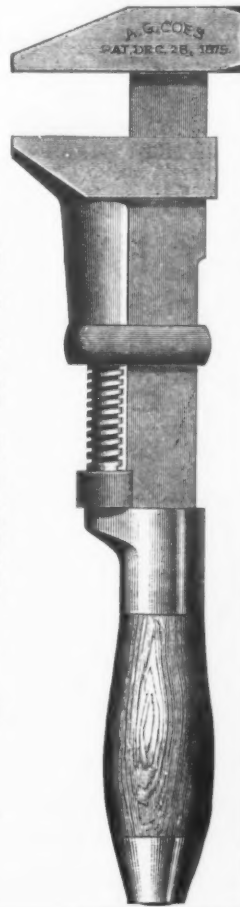
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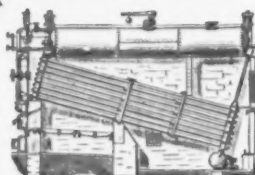
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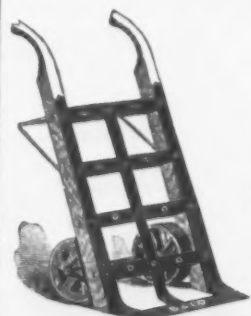
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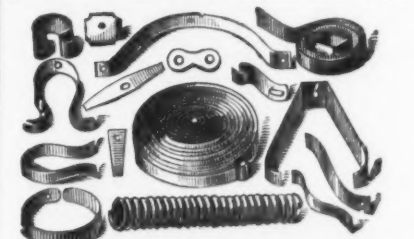
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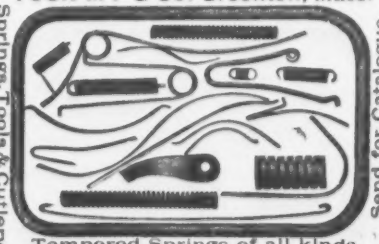
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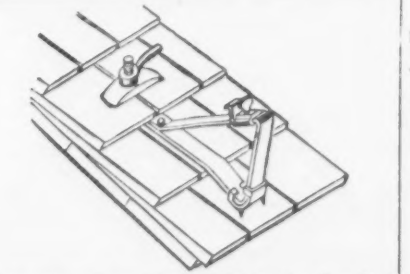
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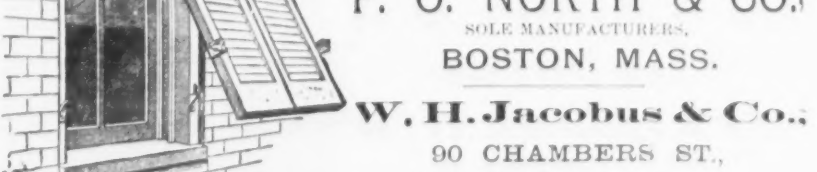
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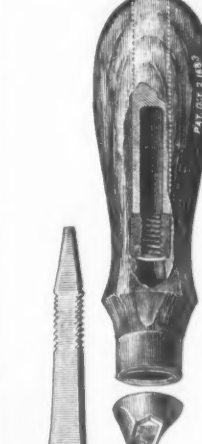
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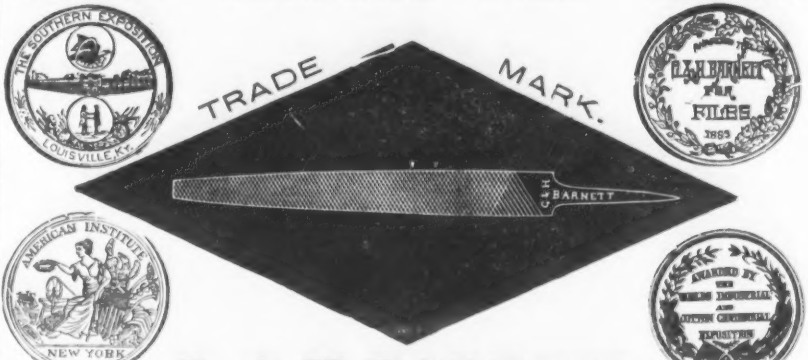


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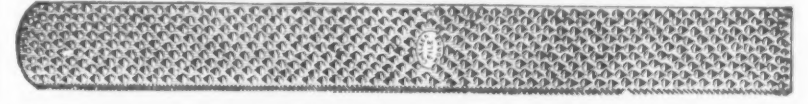


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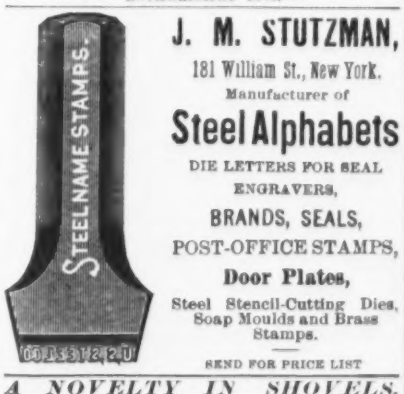
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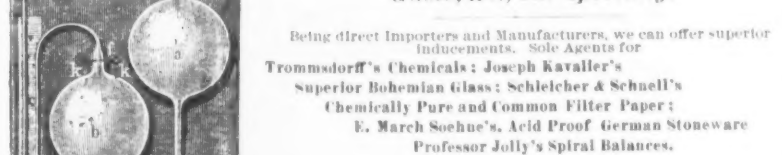
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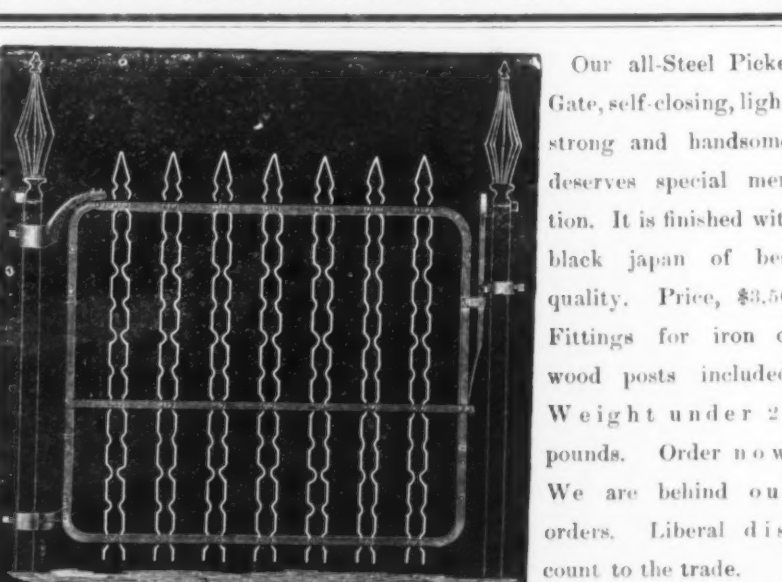
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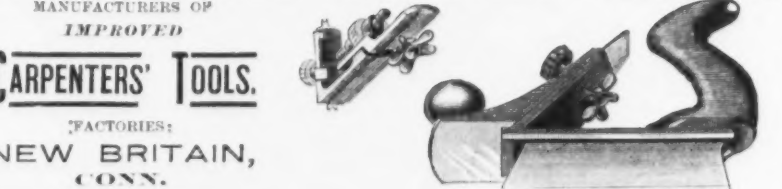
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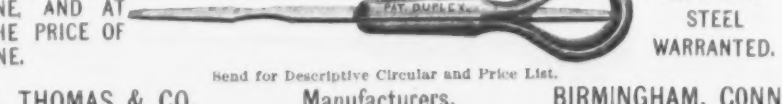
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The Strike in the Coke Region.

Since our last issue there has been no perceptible change in the condition of affairs in the Connellsville coke region. At present writing it looks as if both sides had settled down to the firm determination to make no concessions, even if it is necessary to prolong the strike all summer. No effort has been made as yet by the operators to supply the places of the strikers, and none of the workmen have been evicted. From this it would seem that the operators do not expect the strike to be prolonged for any great length of time. The strike, while it is the largest that has occurred in the region, is the most orderly, no disturbance of any kind having taken place. The Connellsville Courier, of the 14th inst., says:

There is not any coke trade to speak of just now, but it was right brisk last month, when the shipments aggregated 26,650 cars, an average daily output of 1025 cars, as against 953 for the month previous. Of the total output for April the syndicate marketed 18,200 cars, and the outside producers 8450. The figures for the month previous were 17,300 and 8700. The syndicate gained ground on the outsiders last month. The total output was marketed as follows: West of Pittsburgh, 13,450 cars; Pittsburgh and rivers, 8520; east of Connellsville, 4680. The figures for March were 12,200 west, 6800 Pittsburgh and 7000 east. It will be observed that the shipments to Pittsburgh and the west have increased upward of 3000 cars, while those east have fallen off in nearly corresponding ratio. This was one of the results of the Interstate Commerce law. The new schedules have increased the rates on Eastern coke so materially that many furnaces have gone back to anthracite, which they have at their doors. Others are using the coke of the Punxsutawney and Clearfield regions. The starting up of several new furnaces in Pittsburgh last month, notably the new Bessmer and Laughlin furnaces, increased the demand for coke there, while the extra 1250 cars sent West were merely shoved in by the shippers because they had no other destinations for them. There are just 581 out of the 10,952 coke ovens in the region making coke, and these are all furnace ovens, though some of them, notably Lemont, whose furnace is undergoing repairs, are shipping their product. The works in operation are as follows: Oliphant, 60 out of 130 ovens, to supply furnace; Stewart, 120 ovens, to supply furnace at Sharon; Hill Farm, 80 ovens, to supply Dunbar furnace; Tyrone, 162 ovens, to supply Laughlin furnaces; and Lemont, 150 ovens, shipping to J. W. Moore's customers. The daily output from the region is estimated at 25 cars, just 1000 less than the daily output when the region is running full.

A meeting of the coke syndicate will be held in the Lewis Block, Pittsburgh, on the 20th inst., when it is expected important action will be taken.

M. Spitzer, an Austrian born in Vienna, but a citizen of Paris, has a mansion in the Rue Villejust containing a most notable collection of masterpieces in works of art. A visitor describes wonderful ironwork found in one of the spacious apartments as follows: "Here are locks and keys of wrought iron, chased, damascened, and otherwise worked as if the material were as soft as ivory. One wrought iron lock represents Adam and Eve standing on each side of the tree of knowledge, around whose trunk is wound the serpent. The figures are in high relief; the tree with its branches stands out in the round from the tracery background of the lock, and seek as they will the modern smiths cannot discover the secret of its fabrication. Another iron lock has three compartments in the form of a triptych, and on a background of Gothic open-work tracery are figures in high relief and almost in the round. In the middle compartment at the top is God, and at each side an angel; below is Christ and the Virgin Mary, and below them are souls climbing up to heaven or being flung down to hell by attendant devils. In the right-hand compartment we see hell fire, and quaint devils with long tails prodding unhappy souls and pushing them down into the sea of burning brimstone. On this lock there are nearly 40 figures, each about 2 inches high, and most delicately wrought. The lock is about 9 inches high, each of the side compartments 4 inches broad, and the central panel 6 inches broad. The value of such a piece of work as this cannot be estimated."

Referring to the Interstate Commerce law, Mr. W. B. Strong, president of the Atchison, Topeka and Santa Fe Railroad Company, said at a meeting of stockholders: "As I have already said, the law is an experience, but I have always believed, and experience has confirmed me in this belief, that the principle of public control of railway corporations is a correct one, beneficial to the railways and the public alike. It is, however, a principle peculiarly liable to abuse, and one which when hastily or unwisely exercised is productive of great harm. The true policy for our company, and all railway companies, is to strictly observe all public obligations and to trust the public to be equally just in its treatment of corporations."

The Pennsylvania Railroad Company are placing on sale in Pittsburgh, books of 50-trip tickets between Pittsburgh and Philadelphia for \$354. This is at the rate of \$7.08 per trip.

In the letter of our Washington correspondent last week, reference was made to the work for the Government cruisers of the Standard Steel Castings Company, Thurlow, Pa. A typographical error made the title of the company read "Stanton."

Mr. William Deering, of Chicago, president of the extensive agricultural implement manufacturing company which bears his name, recently made a donation of \$5200 toward the erection of a new building for

the Garrett Biblical Institute, at Evanston, Ill. The new building will be known as Memorial Hall, and will be used entirely for recitation and lecture rooms, chapel and library purposes.

Foreign Markets.

FRANCE

PARIS, May 7, 1887.—Metals.—The local demand has been moderate, with a slight decline in Copper, an advance in Tin and Spelter, and steadiness in Lead, closing, in francs per 100 kg.: Copper, 38 1/2; Tin, 102 1/2; Ingot, 111; Best Selected, 114; and Pure Corcora Ore, 107 1/2. Tin—Banco, 277 1/2; Billiton, 275; Straits, 272 1/2; and English, 272 1/2. Lead, 31 1/2; 31 1/2, and Spelter, 38 1/2. Iron—Has continued quiet in this market at 12 1/2 francs for blooms and 12 1/2 francs for old Rals remaining unaltered. At St. Didier the iron demand has remained tolerably active; prices are well sustained. Coke Merchant being quoted 14 1/2; 14 1/2; Mixed, 15 1/2; 15 1/2; Machine Coke No. 20, 18; No. 18, 19; Wire No. 18, No. 18, 22 1/2, and Chains, Nos. 22 to 23, 10 francs. Foundries are doing well in the district. At Valenciennes the understanding arrived at among rolling mill owners supports prices, but actual requirements, which for a couple of months past have not been equal to the capacity of output. *Moniteur des Interets Industriels.*

BELGIUM

BRUSSELS, May 7, 1887.—Iron.—The demand for blooms at Charleroi is in excess of the capacity of makers by 30 1/2 to 35 1/2, some 150,000 tons thereof being required; the price has consequently been raised 50¢ per 100 kg. On the other hand, finished iron generally is quiet, but very firm and so is Pig. The Belgian markets are chiefly strengthened at present by the heavy export demand coming from Transatlantic countries, any momentary dullness and weakness elsewhere in Europe is consequently less felt than would otherwise be the case. Italy is also taking a good deal of Belgian railroad material. Forge Pig may be quoted 1.60 1/2 francs; Foundry Pig No. 3 has meanwhile been selling rather slowly at 1.70.—*Moniteur Industriel.*

GERMANY

HAMBURG, May 7, 1887.—Iron.—A quieter feeling has prevailed in the Rhenish-Westphalian market. Pig iron has continued to move off steadily, except Forge Pig in the Siegen district, where it has had to be shaded in consequence. Spigot and Foundry Pig are less firm, but Thomas, Bessemer and Luxembourg were well sustained. A partial slackening in the demand for finished iron has occurred without leading to a decline from first hands, but dealers are offering their holdings lower in some instances. The associated makers maintain the price of 10 marks per ton for Merchant. The building demand being unusually brisk Beams are in brisker request than ever. Thin Sheets being neglected, they are weaker, with quite a decline at Siegen; Boiler Sheets are dragging, but are nevertheless unaltered. Wire Rods are dull, there being a lack of export orders. The Steel branch, taken as a whole, has no reason for complaint, but way material is fully sustained. Car-makers are busy, both for export and in supplying the domestic requirements, but foreign competition keeps prices low. Machine shops, foundries and boiler-makers are only in part fully engaged. In Upper Silesia contracts in Pig iron for Russia, in view of the contemplated higher duties in the latter country, continue being made on a large scale. The rolling mill branch reports favorably; associated makers have opened a common selling office at Berlin, which will also sell for export. The wire branch has finished orders enough to decline fresh ones stipulating delivery before August. Metals.—Lead has been selling slowly; Copper is firmer. Spelter higher. We quote at the close in marks per 50 kg.: German Lead 13 1/2; Lake Copper, 43 1/2; Tin, 104 1/2; Spelter, spot, 14.80 1/2; 15.20; to arrive, 14 1/2; 14.50; Sheet Zinc Silesian, 17 1/2; 18; Vieille Montagne, 20.30 1/2; 20.70; Zinc, Grav., 20 1/2; 22; Zinc, White, 21 1/2; 23; Nickel, 4 1/2; 4.50 1/2 kg.—*Bornenhalle.*

HOLLAND

ROTTERDAM, May 4, 1887.—Tin.—Following are the official statistics for April:

	1887.	1886.	1885.
Slabs.	Slabs.	Slabs.	Slabs.
Stock on warrants with the Netherland Trading Company, Amsterdam, May 1.	8,328	14,300	37,715
Stock on warrants with the Netherland Trading Company, Rotterdam, May 1.	8,040	6,380	8,954
Total	16,368	20,680	46,669
Billiton stock in Holland	21,333	17,396	40,035
Total stock in Holland	37,701	37,846	86,704
April deliveries of Banca	13,300	13,900	10,752
April deliveries of Billiton	7,237	6,108	6,900
Total deliveries	20,537	20,008	17,652
Banca afloat	9,000	20,810	4,320
Company's stock awaiting coming auctions	75,709	72,164	118,633
Billiton afloat	32,400	33,469	45,706
Price of Banca	11.62 1/2	11.55 1/2	11.48 1/2
Price of Billiton	11.61 1/2	11.56 1/2	11.48 1/2

Since the beginning of the month the market has been firm, 62 1/2 to 62 3/4 being paid for Banca, and for Billiton spot and afloat, 62 1/2.—*Koch & Vletterboom.*

SPAIN

BILBAO, April 30, 1887.—Iron Ore.—A few single cargoes have been taken during the week at 6 1/2 to 7 for Campamil, and 6 1/2 to 6 3/4 for Rubios Superiores. Exportation on previous contracts had been large again, 119,359 tons having been shipped; the Triano railroad alone did so at the rate of 7500 to 8000 tons per day. Total shipments of Ore so far 1,491,208, against 1,115,580 same time last year. Pig Iron.—Sales have been steady both for home use and export. The official returns of export from Spain during the first two months are as under:

	1886.	1887.
Tons.	Tons.	Tons.
Calamine	10,019	3,810
Pyrites	123,149	98,612
Iron Ore	722,518	829,717
Copper Precipitate	4,330	4,338
Quicksilver	423	235
Pig Lead	20,707	19,701
Total	880,846	966,413

—*Bilbao Maritime y Comercial.*

CHILE

VALPARAISO, March 31, 1887.—Copper.—The rise in exchange has caused a decline to \$10.45 per quintal, at which 15,000 quintals have been sold, and which equals \$29.23 in England. Nitrate.—The inquiry meeting has been adjourned to the 28th inst. Meanwhile a large trade to arrive has been done to provide cargoes for vessels chartered in Europe, and gradually making their appearance, \$2.65 per quintal being paid for 96 1/2, sales footing up 1,127,000 quintals. February shipments reached 567,514 quintals to Europe, and 140,718 to the United States, together 708,232 quintals, and there remained loading 567,514.

Export from January 1 to Date

	1886.	1887.
Quintals.	Quintals.	Quintals.
To the South of Europe	677,473	1,296,566
To the North of Europe	38,500	38,500
To the United States, Atlantic	105,615	164,666
To the United States, Pacific	66,713	31,000
Total	848,301	1,531,132

—*Weber & Co.*

EAST INDIES

SINGAPORE, April 11, 1887.—Tin.—Tin touched \$38.50, and could not be bought under this price, but a firmer exchange and a drop in London, will probably lead to lower prices when the market reopens. Stocks here are very small, but dealers look for large supplies next month. Buyers only offer \$38. Tonnage.—For New York the steamer Devonshire has not yet commenced engaging freight; the Wm. McInerney is loading at unchanged rates. For Boston the Wildwood continues her loading. Exchange—Touched \$3.38 for six months' credit bills, and closed at \$3.17 1/2. The steamer Hector took for New York from here 1415 piculs Tin.—*Giffman, Wood & Co.*

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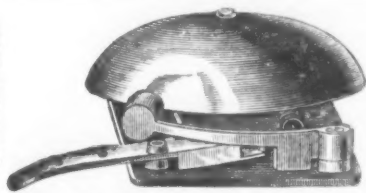
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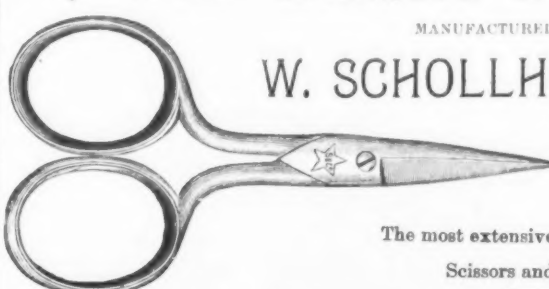
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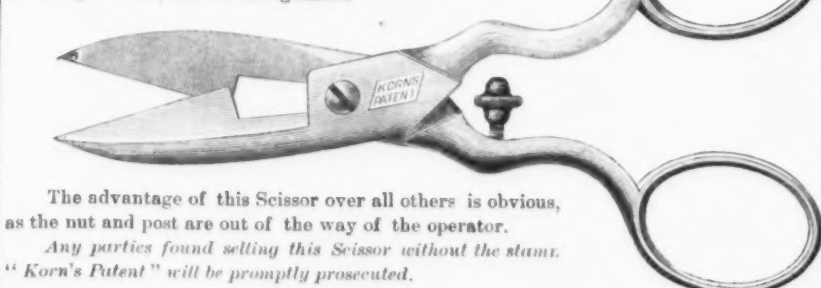
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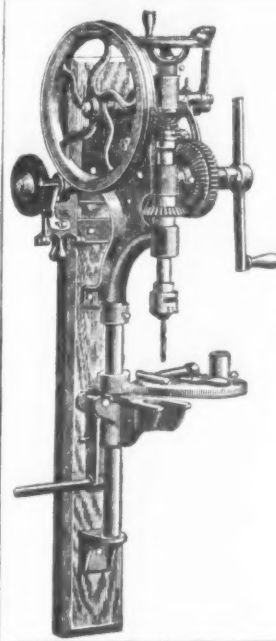
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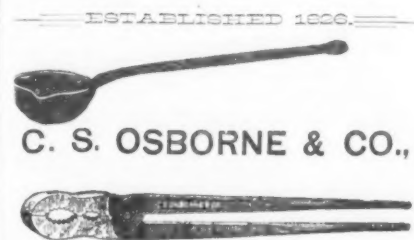
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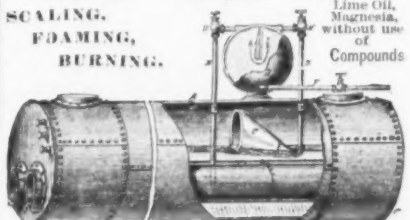
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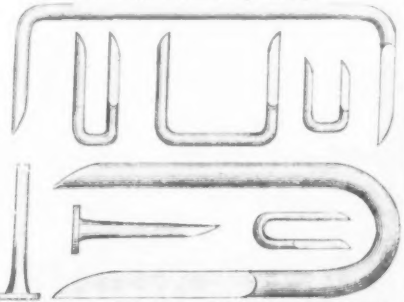
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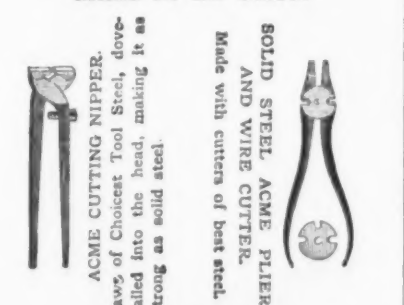
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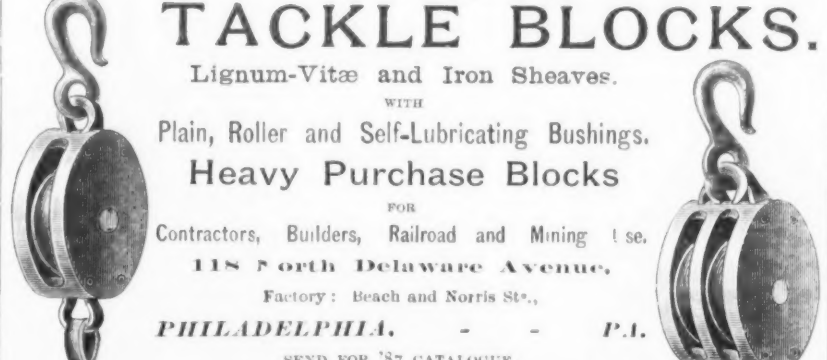
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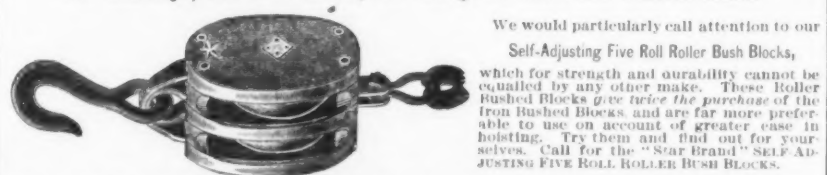
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English Letter.

(From Our Regular Correspondent.)
LONDON, May 2, 1887.

THE OUTLOOK.

taken as a whole, is, in some quarters, considered to be a little better as regards some branches of the iron trade. Personally I am not able to perceive any particular change either for the better or for the worse, but "the trade" seem to think there is a distinct improvement in the outlook at Middlesboro', and they are not unwilling to do the best they can with the very meager materials at their disposal. So far as the crude iron branch at Middlesboro' is in question the point may be conceded, but it is very difficult to perceive hopeful indications elsewhere or in any other departments of the British iron trade. At Glasgow the huge pile of pig iron held by Connal & Co. is constantly being augmented, and the make in Scotland has been increased by the starting of another furnace. Neither of these facts seem to me to afford ground for "bullish" movements, but the gentlemen who are pleased to run the "iron ring" at Glasgow are so entirely independent of ordinary considerations that they may, perhaps, deem it right to try another upward movement. On what basis they can do this I do not profess to be able to foretell, but as there are half a dozen or so cautious (very cautious) American inquiries about pig iron and rails, they may, perhaps, use these as efficiently as any other weapon available. While referring to the Glasgow "hoses," I take the opportunity of mentioning a certain somewhat significant change which has been carried out under the direction, or at all events with the open sanction, of the Glasgow Iron Brokers' Association. This change relates to the warrant system as applied to the storage of hematite pig iron at Whitehaven, Workington and other ports on the Coast of Cumberland. Hitherto this class of pig iron has had general warrants issued in respect of it, and it was at the option of the storekeepers as to what iron was delivered from the stores to any purchaser who bought a warrant and wished to have the iron. It has now been decided that warrants may be issued for any given brand, or class of pig iron stored, so that henceforth a buyer will know, if he likes, what he is buying and be certain that he does not give a top price for a low grade iron. The alteration is a good one, and to be commended. I have to ask, however, why the same change cannot be made at Glasgow? The pig iron is stored there in almost precisely the same manner as on the West Coast, and general warrants are issued for it. Will the Iron Brokers' Association now authorize Messrs. Connal to specify the brand on each warrant, so that the buyer desiring delivery may know beforehand, and be sure to get exactly what he requires. If so, then I venture to prophesy great things for Glasgow, but I fear that there is little or no chance of the reform indicated being carried out, seeing that the whole warrant system is largely built up on what may be termed "anonymity," and if warrants were specialized, the occupation of those Othellos, who simply make pig to create warrants, would be sadly undermined, and perhaps wholly destroyed. *Nous verrons.*

The opening of the American Exhibition in London is now imminent. It is being rather artfully advertised, but seems to consist very largely of "Buffalo Bill." Not having seen the exhibits, it would be unfair to prejudge the show, but so far as I can gather it is not likely to have any very important effects upon the development of American trade in Great Britain.

THE IRON MARKET

is a little more hopeful. The improvement, if such it can be called, has taken its rise in Cleveland, in which district both stocks and shipments compare favorably with what they were a short time ago. Further, there is a slight promise of still better shipments, and it is believed that buyers from the United States are quietly endeavoring to place orders. For No. 3 G. M. B. 34/6 have been paid. In Scotland there has been an increase in the number of furnaces blowing, and a not wholly favorable state of shipments, stocks being unaltered for the better. Warrants closed at 41/5 $\frac{1}{2}$ ton. On the West Coast matters practically remain as they were. The rates for mixed numbers of hematite are about 43/6 $\frac{1}{2}$ ton. Staffordshire producers report a tolerably fair business, taking trade as a whole. In the finished departments, with one or two exceptions, there does not appear to be so much doing as there was, say a month or six weeks ago. In Galvanized sheet there is a decided dullness, owing to the low limits offered by buyers, while for Black Sheets the demand is by no means brisk. In bars, angles, tees, hoops, &c., a steady business has been done, but makers complain that not only are prices low, but the quantities ordered are small. As to prices, it is alleged by one or two merchants that they can buy now at rather easier rates than could be secured at the dullest period of last year, but makers report fairly good prices. It is rumored that for Bars and Hoops, feelers have been put forward from the United States, but no special transactions have been concluded. In plates and bridge-work some makers are exceptionally well off, while others are complaining about the lack of specifications. Some further bridgework is being asked for for India, and other specifications are shortly to be issued for the same country. Old rails and scrap are quiet, buyers keeping back and sellers showing indifference. Freight for pig iron from Glasgow to New York by ordinary steamer remain firm at 7/6 $\frac{1}{2}$ ton. Steel is in virtually the same position, but some of the departments are easier. This is notably the case with rail blooms for the United States, the demand being quiet just now. Siemens-Martin billets are quoted at 90/1, and basic billets at 80/1 $\frac{1}{2}$ ton, f.o.b. Glasgow. The Steel Company of Scotland have reduced steel angles to £5.15/6, ordinary steel plates to £6.15/6, and boiler plates to £7 $\frac{1}{2}$ ton. Steel rails have been fairly inquired for. The Bombay and Baroda Rail-

way are asking for about 3,400 tons, and it is reported that in addition to business already done with the United States some 40,000 or 50,000 tons are about to be placed on this market for a Western railway, subject to certain financial conditions. This means, I believe, that the road wanting the rails also requires financing on this side; consequently the order for the rails looks just a little distant. Apart from this quantity there are inquiries from the States for other lots, amounting in the aggregate to about 20,000 tons. Business for the States has been done during the last few days, some 3,000, or perhaps rather more, tons having been placed with the Moss Bay Company at a fairly good price above £4. For ordinary sections the normal quotations are from £4.2/6 to £4.5/6.

SCOTCH PIG IRON is a shade better, after a few days of considerable weakness, and warrants stand at about 41/5, as compared with 38/3 a year ago, an improvement of a few pence having been brought about by the lessened additions to the reserved stock last week. There are now 81 furnaces at work, against 95 this date in 1886. In Connal's stores there are 805,836 tons (an increase of 742 tons last week), compared with 712,076 tons this date last year. Shipments were 1514 tons comparatively worse last year, but are 11,532 tons ahead this year. Imports of Middlesboro' pig iron are 13,119 tons ahead.

MIDDLESBORO' PIG IRON is rather firmer, mainly owing to the returns of the shipments during April, showing 78,000 tons of pig iron and 47,000 tons of steel and manufactured iron, or about 12 1/2 % better than in March.

HEMATITE PIG IRON is about the same as last week, mixed lots varying from about 43/6 up to 46/6 $\frac{1}{2}$ ton. There are now 54 furnaces blowing, as against 43 a year ago, on the West Coast. Stocks there in stores only are 178,002 tons, or 45,002 tons more than at Christmas last. Pig iron shipments increased by over 800 tons last week, and are 3058 tons ahead this year, while rail shipments are 59,645 tons ahead to date.

TIN PLATES.

In London there is no appreciable change, a general feeling of quietude prevailing all round. I quote, as last week, ordinary IC cokes, f.o.b. Liverpool, 12/9 @ 13/1. At Liverpool the business transacted in ordinary sizes has not been extensive, but there have been a few good orders for specialties as to sizes and substances, especially in Bessemer steel plates with coke tinning, as well as for Siemens steel plates in the same grade of tinning. There has also been some little business doing in ordinary kinds of coke tin plates, but only a few of the common brands have been obtainable under 12/9 IC. The good brands of coke sizes are still 12/9 @ 13/6 IC, and Bessemer steel cokes 12/9 @ 13/6 IC. Siemens steel plates, with coke tinning, remain at 13/6 @ 14/1 IC. Wasters of these three sets are again in fair demand at 12/3 @ 12/9. There are a few more inquiries to hand for charcoal tin plates, as well as best charcoal tin plates, Bessemer charcoals being 14/ @ 14/6 IC; Siemens steel charcoals, 15/ @ 16/ IC, and best charcoals, 16/6 @ 17/6 IC. The demand forterne plates has almost become stationary again. Prices are not firm, 12/ @ 13/ being the general figure for ordinary sorts, and others at 13/6 @ 14/ IC.

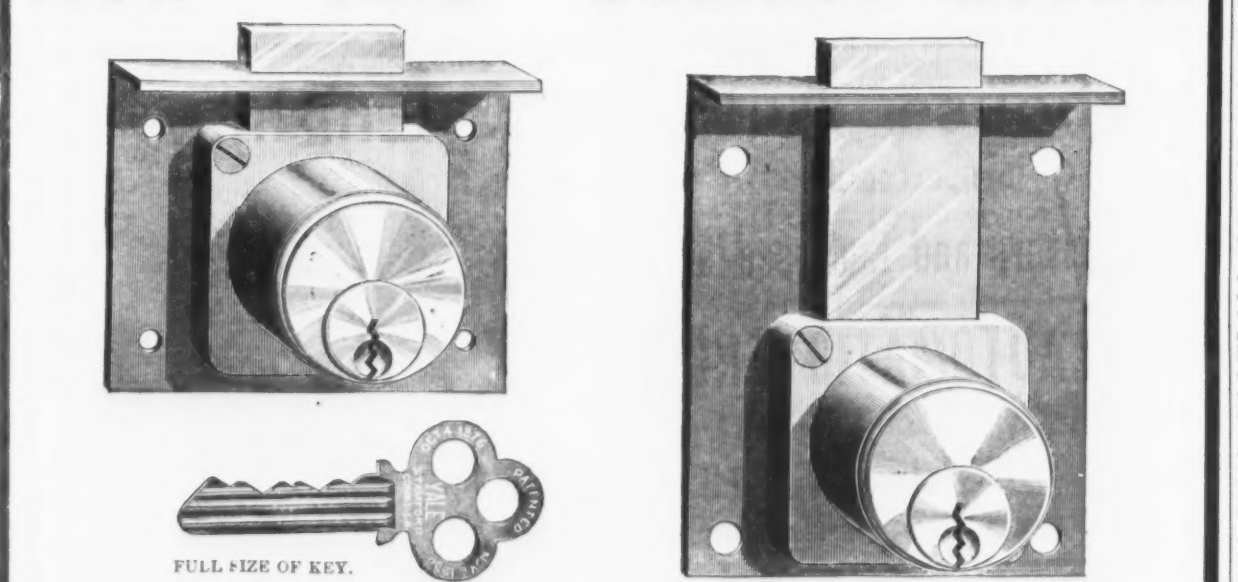
THE HARDWARE TRADES.

In London the unpropitious weather has prevented householders from venturing out for other than purely necessary shopping, and the same cause has interfered with the work of travelers. Apart from the mere accident of the weather, however, there is a cheerful spirit abroad, and although the spring demand has been retarded, it is not unlikely to prove quite up to the average in the long run. Makers of wire netting are reported as well off for orders, and some houses are so far booked for the season that it is somewhat a matter of indifference with them whether they secure more orders or not. The demand for paints, varnishes and allied goods is steadily maintained, though at extremely low prices. There is now quite a rush in the painting and kindred branches, and furnishing ironmongery is having a satisfactory sale. At Birmingham the sudden return of winter, though of brief duration, has checked more than the vegetation, and complaints are general of the disorganization of trade caused by this unreasonable inclemency. The shipping trade, however, is not appreciably affected, and some rather good incidents have come to hand, more particularly from South Africa, Canada and Australia. The award of the president of the Iron Wages Board declaring wages unaltered was generally foreseen by masters and men, and it will not therefore affect in any way the condition of the trade. At Sheffield the general improvement in business is fairly well maintained, and there is certainly more industrial activity now than at the corresponding period of last year. There is more doing in Sheffield crucible steel, especially as regards brands of the highest repute. The Bessemer demand, however, does not sustain recent anticipations. Boiler makers, rail mills, wagon works and works generally engaged in railway or tramway rolling stock continue to be fairly well employed, and so also are firms engaged in the execution of Government contracts for plates and steel castings for ordnance, marine engines, &c.

We learn from current reports that electrical distribution of power is being tested in a practical way in San Francisco. The San Francisco Tool Company, of that city, have put one of Prof. N. S. Keith's dynamos in their establishment, and run it by a small independent single-acting engine. From this dynamo wires are run to electric motors in the vicinity, and power is thus furnished.

The steel sloop Titania, built for Oliver Lælin, and launched from Henry Piegras's yard, on City Island, last Saturday, is pronounced a beautiful specimen of marine architecture. She was designed by Edward Burgess, and is built entirely of mild steel. The plating is 1/4 inch in thickness; her length at water line 69 9/16 inches.

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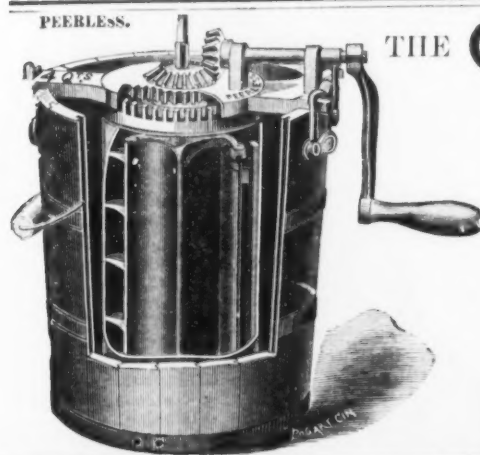
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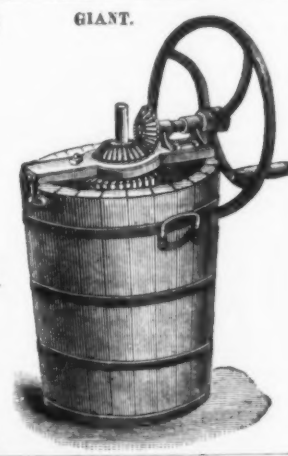
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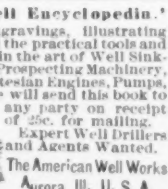
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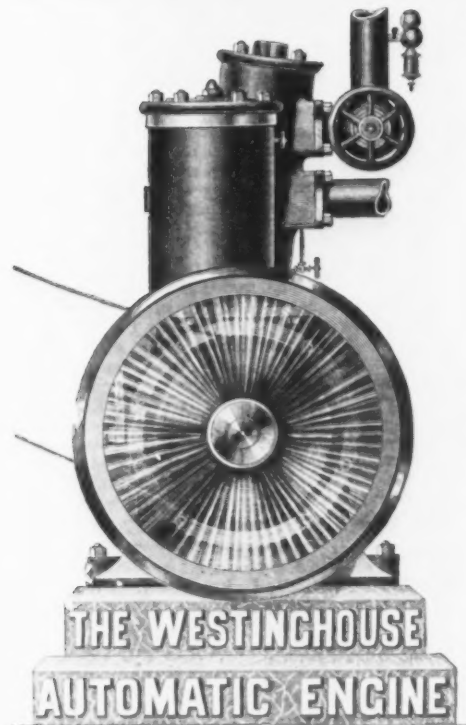
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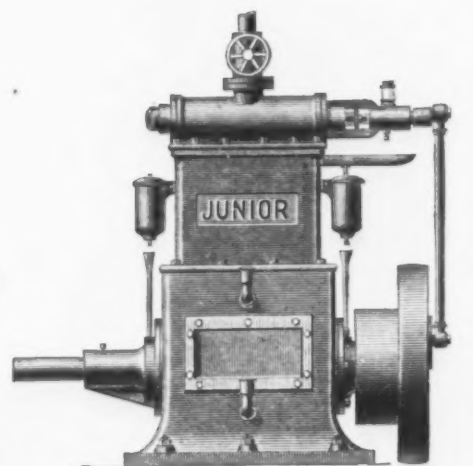
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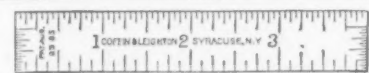
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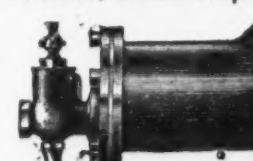
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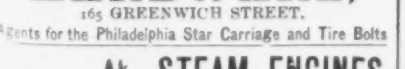
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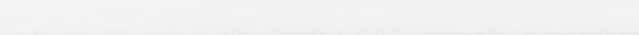
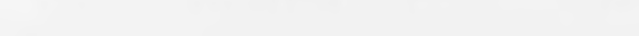
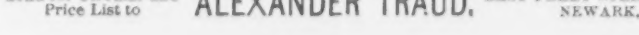
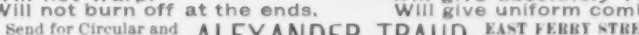
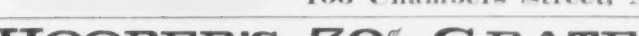
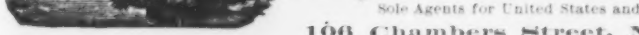
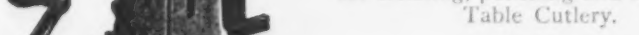
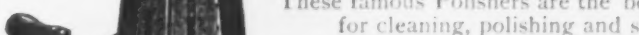
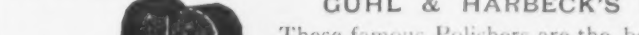
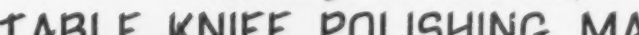
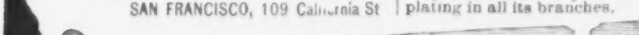
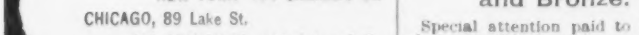
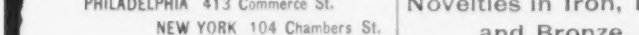
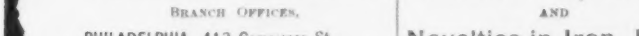
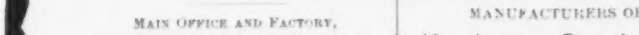
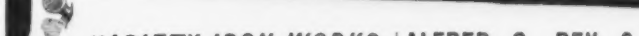
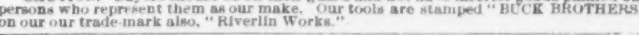
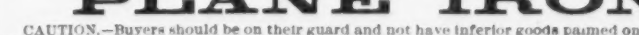
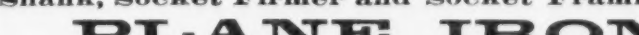
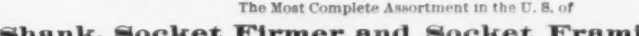
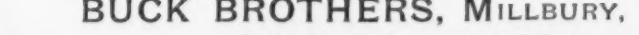
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SCOTCH GAUGE GLASSES.

SOLE AGENTS FOR TANITE EMERY WHEELS



THE WEEK.

At Beaver Falls, Pa., 11th inst., a spark
from the steam hammer in the Baker
Wagon, Iron and Chain Company Works
fell into some cotton waste and in five min-
utes the establishment was in flames. It
was totally destroyed. It was owned by J.
H. Baker, and Oliver Bros. & Phillips, who
estimate the loss at \$100,000, on which there
is insurance of \$38,000. This is the third
time the establishment has been destroyed
by fire, and whether or not it will be rebuilt
is unknown yet.

The summer exodus to Europe commenced
last Saturday.

The agricultural products of the Argentine
Republic have rapidly acquired importance
under the stimulus of heavy immigration
and lavish expenditure in the prosecution of
public works. More than 5,000,000 acres
are under cultivation, and the aggregate
value of the products gathered is estimated
as follows, in pounds sterling:

	Acres.	Value.
Wheat	2,080,000	\$2,400,000
Corn	980,000	1,000,000
Luncheon	125,000	400,000
Sugar	50,000	600,000
Tobacco	30,000	240,000
Wine	65,000	1,200,000
Hay	1,050,000	5,000,000
Fruit, &c.	200,000	1,000,000
Total	7,185,000	\$12,440,000

The wheat crop reaches 20,000,000 bushels,
of which one-half will remain for exporta-
tion, while the total agricultural exports
will represent a value of \$2,500,000.

Germans are much elated by their success
in concluding a loan to the Government of
China, and expect, through their diplomatic
representative at Peking, to take a hand in
building railways which have been resolved
upon, and to secure contracts in completing
the fleet.

A number of Knights of Labor have ap-
plied to the Mayor of Brooklyn to limit a
day's work to eight hours, and particularly
as to work on the great bridge, the plea
being that more men could be employed
than there are now.

The last and fourth caisson for the Pough-
keepsie Bridge is being sunk, and the con-
struction of the bridge is far in advance of
the terms of the contract. Extra men have
been put to work to handle the large quan-
tity of ironwork which has arrived and is
ready to be placed. The construction has
commenced from the east shore pier.

A bill appropriating \$312,000 for extend-
ing the Metropolitan Museum has passed
both branches of the New York Legislature.

Lieut. W. H. Jacques, of the navy, who
has had considerable experience in the pro-
duction of steel, and who has been con-
nected with the Gun Foundry Board that
visited all the principal steel works of this
and foreign countries, has received an offer
of employment by the Bethlehem Steel
Works, now preparing to carry out the
heavy steel contracts awarded to it by the
Government, and that offer will probably be
accepted.

A national convention of machinists and
blacksmiths will be held in Pittsburgh early
in June. Among the questions to be consid-
ered are the more complete organization of
the machinists and blacksmiths of the coun-
try, and the regulation of the apprentice
system and the hours of labor. It is pro-
posed that all who want to find employment
in union mills or to join the assembly serve
full four years' apprenticeship.

The mining capitalists of St. Louis give
notice that they will remove to New York
City if the new law taxing mining stock is
enforced.

The establishment of a parcel post between
the United States, the West Indian Islands,
Central and South America is in contempla-
tion by the Postmaster-General, and over-
tures to this end have already been sub-
mitted to the authorities in Jamaica. The
proposition is that, in addition to the bona
fide trade patterns and samples of merchan-
dise, the transmission of which is specially
provided for in the Postal Union Convention,
there shall be admitted packages of merchan-
dise of every description, without re-
gard to the saleable value of the contents or
to their liability to customs duties in the
country of destination, provided they do not
exceed four pounds in weight. It is further
stipulated that said packages shall be subject,
in the country of destination, to all of the
customs regulations in force in that country
for the protection of its customs revenues
and to the rates of postage in the country of
origin, which shall be required to be fully
repaid, thus securing the delivery of such
packages to addressees without additional
charge for postage.

Immigration is on a scale rarely surpassed,
the average arrivals per day at this port
having been little short of 2000. Since Janu-
ary 1 the total is 44,000 in excess of the ar-
rivals for the corresponding months last
year.

On Saturday a Buffalo jury convicted
Hiram B. Everest and son, officers of the
Rochester Vacuum Oil Company, of conspir-
ing to destroy the Buffalo Lubricating Oil
Company, who are rivals in business. The
complaint included certain New York rep-
resentatives of the Standard Oil Company,
the parties understood to control the Roch-
ester concern, but the prosecution failed to
establish their direct connection with the
crime alleged. One of the principal wit-
nesses was Albert A. Miller, formerly super-
intendent of the Rochester works, who en-

tered into business engagements with the
Buffalo company, and, as appeared from the
testimony, was influenced by the receipt of
money from the Everests to betray the busi-
ness secrets and otherwise effect the ruin
of the Buffalo Lubricating Oil Company. An
appeal is probable.

St. John and Fredericton, New Bruns-
wick, like Montreal, have suffered from
floods which inundated a large part of the
surrounding country. Ten million feet of
lumber have been swept out of the booms in
Fredericton, and most of it carried out to
sea. At Westfield, 15 miles from St. John,
the Nerepis bridge, erected in 1874 at a
cost of \$200,000, was carried away.

Senator Rengan, of Texas, the father of
the Interstate law, in explaining some of its
provisions, declares that Section 4 is an iron-
clad rule, and, after defending the statute
in all its parts, concludes as follows: "I
have tried to show, first, that the commis-
sion had no power to suspend a law of Con-
gress; and, second, if they had as a matter
of discretion the power to do so, that it
would be a great wrong and injury to the
public, and to a large extent would defeat
the great and beneficent purpose of Con-
gress to protect the people against wrong
and oppression, and to subject these corpo-
rations to the control and supervision of law,
as all other persons, natural and artificial,
are. During all the years this great ques-
tion was before Congress the paramount
issue was whether the people of this country,
through the agency of Congress or the rail-
road corporations, should dictate the policy
and control the commercial interests of the
common people. The people at last tri-
umphed in the passage of this important and
fair and just law. Ever since its passage
the railroad corporations have, through
their officers, agents, lawyers and hired
newspapers, been engaged in a most extra-
ordinary conspiracy to secure the nullifica-
tion of one, at least, of its important pro-
visions. Millions of people with interests
involved of thousands of millions of dollars,
and with political interests far greater than
any moneyed interests at stake, with bated
breath are looking earnestly and anxiously to
see whether the commission is to be misled
and their rights and interests sacrificed, or
whether the law is to be sustained and their
pecuniary political rights preserved."

The recent decision by Assistant Sec-
retary Maynard, to the effect that platinum
wire is entitled to free entry as unmanu-
factured, has called forth some vigorous
protests. One New York manufacturer and
dealer claims that the decision was rendered
when but one side had been heard, and that
it can be shown to have been based upon
misrepresentations. He asserts that crude
platinum need not be drawn into the form
of wire unless it is for commercial use in
that form, and that platinum wire is a man-
ufacture and as such has its commercial
value and use.

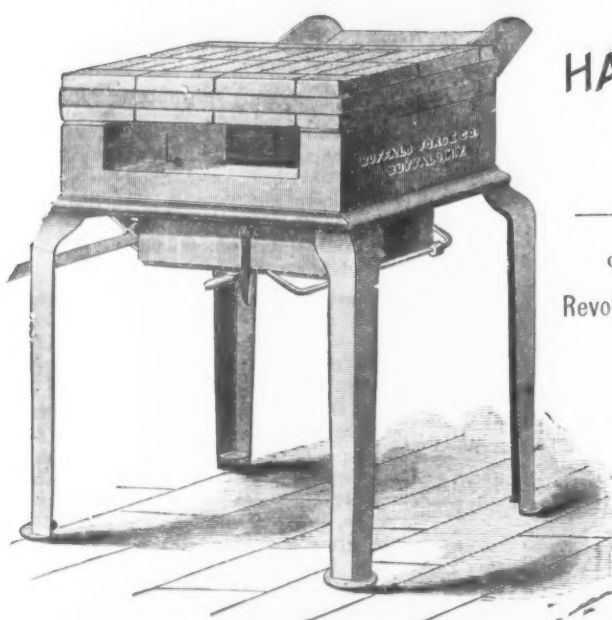
The American Institute of Mining En-
gineers may hold a summer meeting at Salt
Lake City and Butte, Mont. In the event
of a sufficient number of participants, the
members of the Institute will assemble at
Chicago on July 1 and proceed to Denver,
where they will spend one day, going from
that place to Pueblo, where another day
will be spent, and from there to Salt Lake,
via the Denver and Rio Grande. At Salt
Lake City a stop of four days will be made,
after which the party will proceed to Butte,
remaining four days at that place and one
at Helena. After leaving Helena the Yel-
lowstone Park will be visited, whence the
party will proceed to Duluth and thence by
steamer to Cleveland. The cost of the trip
will be \$270. A meeting at Duluth, either
in the middle or the end of July, has been
decided upon in any case, the members to
visit the Vermillion and Gogebic iron ranges.

The new East River Bridge Commission,
comprising the mayors and heads of depart-
ments in the cities of New York and Brook-
lyn, met on Friday in Mayor Hewitt's office
and heard much testimony as to the neces-
sity and feasibility of a bridge or tunnel
between the two cities. Views were widely
at variance, and in the final vote it appeared
that New York disapproved of the scheme,
while Brooklyn favored. As to the feasi-
bility, there was but one opinion. All
agreed that a bridge could be built, but they
were quite as unanimous that a structure
such as was contemplated by the Legislature
would practically be a failure.

The improved Stock Exchange building in
New York city has a trading-room containing
13,400 square feet, nearly double its former
capacity, surrounded on all sides by a deep
gallery. Its walls extend to the roof of the
building, which centers in an immense
dome-shaped skylight of cathedral glass,
through which the light is admitted to the
room. The main entrance will be located
upon the Broad street side, the outer door
opening into a vestibule handsomely frescoed
and tiled in marble. Over this vesti-
bule and extending upward to the roof are
four tiers of offices, reached by an elevator
from the trading-room door. On the first
floor, the entire space will be utilized as a
"Board Room," where also the sessions of
the Governing Committee will be held.
The arrangement of this room will be some-
what on the Senate Chamber plan, with its
massive seats ranged in a semi-circle about
the rostrum platform, which will be flanked
by a large bay window overlooking and
slightly overjutting the floor of the trading-
room. The second floor will be set apart for

Will not Warp.
Will not burn off at the ends.
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EAST FERRY STREET IRON WORKS,
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HARD COAL
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COKE.

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AND
Blast Gate.

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Styles
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BUFFALO FORGE COMPANY,
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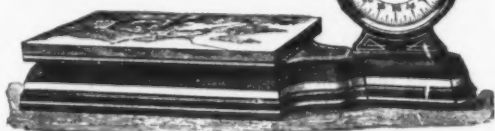
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Manufacturers of the West Patent Lock and Metal Plug Wooden Faucets.

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HENRY B. NEWHALL CO., Agents, 105 Chambers St., New York.

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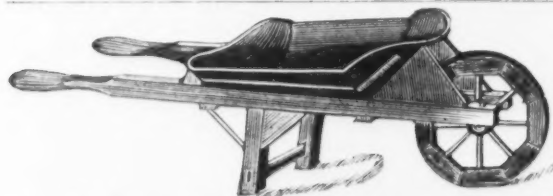
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Manufactured by



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Barrow as a Specialty.

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(LIMITED),

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MAKE A SPECIALTY OF

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NEW PATTERN SMOOTH BACK COAL BARGE SCOOP.



Prices Quoted on Application.

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"EASY"



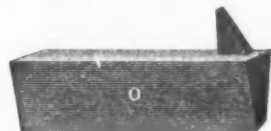
This equals any in durability, while surpasses all in simplicity and the excellence of its work.

A Perfect Beater
AT A
LOW PRICE.

The Easy Beater can be obtained only through the

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Manufacturer of
**PATENT STEEL
Toe Calks,**



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**HOLLOW
THIN
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STANDARD No. 24.



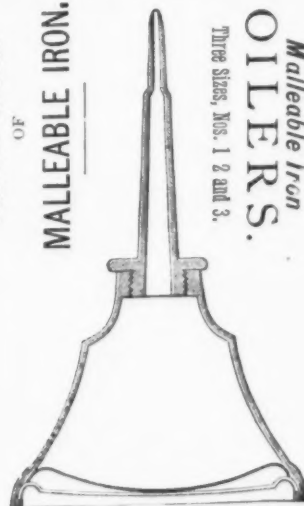
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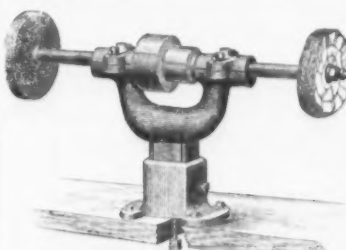
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By this arrangement the fil-
tered water is cooled with-
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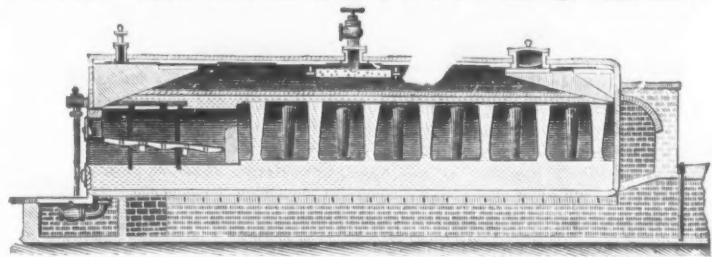
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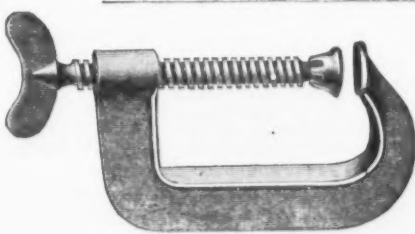
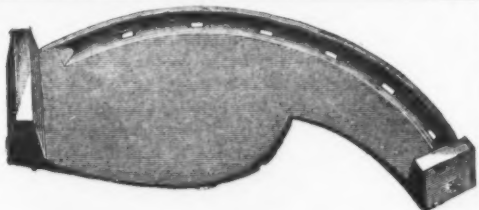
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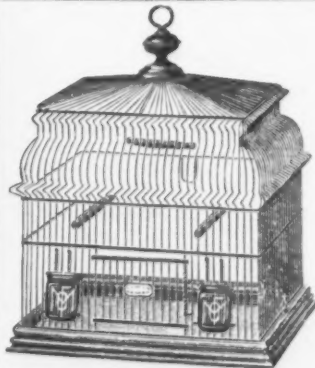
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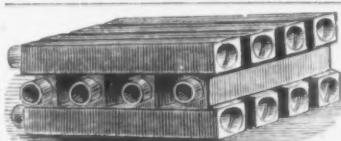
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FOR FINE CUTS KYES & WOODBURY,
ENGRAVERS WORCESTER, MASS.

the offices of President and Secretary, and will contain specially constructed fire-proof cabinets for the thorough protection of the records of the Exchange. The third floor will be occupied by the Exchange library and committee, smoking and chess rooms. The fourth, or top floor, will be applied to the exclusive use of messengers and other employees, and will be thoroughly equipped with lockers and lavatory conveniences. The total improvement will cost in the immediate neighborhood of \$200,000.

The Pennsylvania Legislature decides that Philadelphia can have an elevated railway, removing the last obstacle to this improvement.

High license has become a law in Pennsylvania, and workmen in that state may find it more difficult to get their grog, for which they have reason to be thankful.

St. Louis has adopted the Sprague electric motor for Laclede avenue, and will have the cars running in 90 days.

The cotton industry in Russia has attained enormous proportions, but the efforts of the Government to encourage cotton culture within her own territory, have had only moderate success, so that the imports of the raw material equal \$43,000,000 per annum.

The unity of labor and capital was a subject discussed by Elliott F. Shepard, of the New York bar, in a recent public address. He said that "of all the weak and false catchwords adopted by the so-called labor reformers the latest one—'abolish poverty'—was the weakest and the falsest. The Knights of Labor will abolish poverty when they are able to abolish appetite and abolish sleep." In different forms the unity of capital and labor is coming to be recognized. It is so much greater than the unity of man and wife, so much greater than the unity of the soul and body, that there can be neither divorce nor psychomachy. In closing, Mr. Shepard laid down these propositions: That whatever increases and cheapens production increases the number of wage-earners and their wages; that whatever improves the condition of the employee reduces his cost to the employer, and that a solution of the difficulties resulting from the complaints of injustice on the one side and disorder and lawlessness on the other may be settled upon the basis of the two foregoing propositions.

Thomas A. Edison, who has returned from Florida, says that he made experiments while South which convince him that telegraphing through water without the aid of a wire will ultimately be made possible, so that, for instance, ships several miles apart at sea may communicate with one another.

Sir Charles Tupper, the Minister of Finance in his speech at the opening of the Dominion Parliament, estimated the revenue for the fiscal year ending June 30, at \$35,300,000, the expenditure at \$35,600,000, anticipating a deficit of \$300,000, due to the falling off in the excise receipts. The estimated surplus at the end of the fiscal year, June 30, 1888, will be \$1,360,000. Net debt of Canada, May 1, \$225,105,961. The speaker said the only cloud on the horizon was the threat of non-intercourse on the part of the United States. He hoped and believed that the policy of non-intercourse would not be adopted, but if it were the United States would find in Canada people determined in maintaining admitted rights.

The law firms that defended the anarchists in Chicago are themselves victims of dissension and both have dissolved.

Americans are fast acquiring a title to some of the choicest land in Mexico, and it is predicted that American influence will dominate in the affairs of that republic within half a century. The depression in finance and commerce, with which Mexico during the last three years has been afflicted is giving way to a better feeling. This is specially noticeable in railway construction.

Barbed wire proved useful for telegraphing purposes in California the other day, between Marysville and Sacramento. About 1/4 mile of the line was missing at Bear River, but a connection with the barbed-wire fence not far away was found to answer well as a substitute.

A circular has been issued by General Master Workman Powderly in which, among other things, he recommends that on next Fourth of July the members of the Knights of Labor, where there is an assembly in existence, hold demonstrations and celebrations in honor of the birth of a people's government. "If other societies intend to celebrate the Knights can join in; if no other society will celebrate, then the Knights should celebrate by all means. In localities where a public demonstration would cause some liberty-hating employer to discharge his workmen, I would advise that no risk be taken. Join in with other citizens in getting up celebrations. Secure a speaker to deliver a short address. If no speaker can be had, select a good reader to read the Declaration of American Independence. In the line of march and on your stands and public places use only one flag, the Stars and Stripes. * * * Pass resolutions declaring that the holding of from 50,000,000 to 60,000,000 of acres of the public domain by aliens is sinful and un-American. Go further, and demand that the alien landlord shall let go his hold. Pass resolutions declaring that every acre of land acquired by fraud, perjury or chicanery is an acre stolen, and demand that the thief be required to

make restitution to the people. * * * Make the land for the people, under the people's laws, the question of the day. This is no political question; it is a national, a patriotic question, and must be understood."

Iron-ton, Ohio, seems destined to disappointment, the Belfont gas hole having been sunk 3125 feet, at an expenditure of some \$10,000, without finding the desired supplies of inflammable gas for manufacturing purposes and illumination. But they have an abundance of coal not far away.

The Baltimore and Ohio Railroad Company persists in its attempts to gain a terminus in New York City, having commenced the survey for a new line from Philadelphia up the Delaware Valley, thence to Round Brook, and thence passing over the Arthur Kill, the terminus on Staten Island. Engineers are also surveying the new route by which the Philadelphia and Reading Railroad proposes to reach this city.

Krupp's new rapid firing gun consists of a tube resembling that of a steel field gun, projecting from the port-hole of an ironclad, its carriage being reversible and having a seat for the gunner at its rear.

Another co-operative enterprise has ended in disaster. It was known as the Quaker City Co-operative Mfg. Company, but, owing to lack of capital and mismanagement, some 200 persons who invested their savings in the belief that success was assured have come to grief.

Bed springs have been utilized in Philadelphia to form a fire-escape. The escape consists of four sets of springs 7 feet long and just wide enough when laid together to sit in a bed frame. Each set is attached to the adjoining one by a clamp, which unites iron appendages fastened to the end of the springs. These appendages add to the length of the arrangement so as to make it about 30 feet long when hanging out of the window. One side of each set of springs is fitted with rungs made of wrought iron—the only part of the contrivance not of steel. These rungs, which are on the outside when the springs depend from the window and about 15 inches apart, form a pretty strong ladder, which may be made use of for descent.

The steamer Umbria made a remarkable run on her last passage from Queenstown to New York. From noon of the 6th to noon of the 7th inst. this vessel ran 496 knots. Making the time allowance, this is an average of 20 1/2 nautical miles per hour for a little less than 25 consecutive hours, and this with only a moderate breeze in her favor.

The Saturday half-holiday law takes effect this week, making every Saturday afternoon a legal half holiday, chiefly affecting banks and public offices. The closing of factories and stores remains optional with business men and employers, as heretofore.

The master plumbers of this city will send 24 delegates to the National Association's Convention in Chicago, June 21-23.

The Kingston and Pembroke Iron Mining Company was organized at Kingston, Ontario, on Monday, and expect that 100,000 tons of ore will be taken from their mines this year.

The iron columns and girders for the Kings County Elevated Railroad in Brooklyn are being lifted into their place by means of a huge traveling derrick, now at work on Grand avenue.

The harbor improvements at Vera Cruz, to cost \$4,000,000, are about to be resumed under a French contractor.

A large party of Belgian engineers and workmen left Antwerp a few days ago to establish factories on the Congo River and examine with reference to the construction of railways.

Cornelius and William K. Vanderbilt have become interested in a novel business and benevolent enterprise. It consists in building residences in the suburbs and selling them at cost to actual occupants, and at the same time insuring the owners against a loss of the property in case the head of the family dies before it is fully paid for. The houses will be sold on yearly payments, which will not amount to more than about three times a fair rental; and simultaneously the life of the purchaser will be insured to the extent of the unpaid portion of the price. If he dies, the remaining mortgage is immediately canceled.

Although the New York Legislature will soon adjourn, the bill prohibiting discrimination against shippers by canal is not yet a law.

Elevated railways to connect the ferry landings in this city with the main lines of travel, as originally proposed by the Manhattan Elevated Railway Company, seem to be a coming public necessity, on account of the perils experienced by pedestrians at the river front, on South and West streets, where there is a constant crush of vehicles. The Pennsylvania, Lackawanna, Jersey Central and Erie railroads are anxious to see the lines in operation, and will build double-decked steamers so that passengers can go direct from the boat to the elevated platforms. The Rapid Transit Commission has established the routes, and the several corporations above named are prepared to begin work when the consent of property holders has been obtained, in default of which an appeal may be made to the Supreme Court.

The Iron Age

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Protection for Workmen Against Organized Labor.

The Mayor of New York, in addressing a
meeting of the Locomotive Firemen's Asso-
ciation in this city a few days ago, spoke
wisely as follows:

Every drop of blood in the free American
heart rebels against the infringement of the fun-
damental principles of human liberty. The highest
expression of the human heart and judgment is
the law, which is the only sovereign power in the
country. No man and no set of men have the
right to set up a new tribunal. Americans, in
heritors of a great principle and of a blessing
the value of which no man knows until he has been
deprived of it, will never tolerate this idea. A
delusion may possibly befall the public mind, and
perhaps I may go down under it—the denunciations
which have been leveled against me because
I dared declare that an American has the right
to be free may be too much for me—but truth will
assert itself, and the great fundamental doctrine
of our country will survive as long as there is a
true American heart, and as long as this people is
worthy and fit to be free.

The only persons likely to disagree with
this plain statement of truth are those whose
views are entitled to no consideration among
reasonable men. It emphasizes the sug-
gestion of Mayor Hewitt, made some time
ago, that the workmen who believe in
liberty of action organize for their own
protection. The idea was well received by
business men, and a hearty support, moral
and financial, was pledged to the movement.
We are not aware, however, that any steps
have yet been taken in that direction. The
subject is one we have more than once dis-
cussed in our columns, but its importance
justifies its further presentation.

Up to this time the organization of labor
has proceeded on a false assumption—that
wage-earners are a class having rights and
interests other than and different from those
of other classes. There is no such thing as
the "wage-earning class" in this country.
When we speak of a class in this sense we
mean a condition. Class distinctions do not
exist. A man is this year a worker for
wages. Last year he was an employer;
next year he may again be an employer.
This being true, the idea of class rights and
interests in connection with labor is essen-
tially mischievous. But out of this mistaken
idea has arisen something like a conflict of
classes, and a tyranny in the ranks of or-
ganized labor which operates to place ob-

stacles in the way of those seeking to better
their condition. The individual wage-
earner who will surrender all independence
of judgment and become subservient to the
arbitrary rules made for him, is exempt
from persecution; but when he seeks in his
own way to serve his interests or better his
condition, he becomes the object of the
bitterest, most unreasoning and most tyrannical
persecution. It is this to which Mr.
Hewitt alludes in the words above quoted.

The time has come for the formation of
yet another organization of labor in this
country—a society to protect citizens in the
temporary condition of wage-earners in the
exercise of their civil rights. The happen-
ings of the past few years, and especially
since the Knights of Labor became a power,
have been very instructive as illustrating the
tendency of labor to oppress labor. The
ideal labor organization is one based upon
the broad principles of equity and the rights
of citizenship. It should be at all times
ready to protect labor against oppression,
and equally ready to protect fair and re-
asonable employers against outrage or injus-
tice. It will stand between the individual
and the union which seeks to compel him to
sacrifice his own interests, to leave work
which is offered him on satisfactory terms
or to contribute to the support of
those who are voluntarily idle. It
will be the refuge and defense of those in
the ranks of labor who, while ready to
maintain their rights under all circum-
stances, have that respect for the rights of
others which the law promises and good citi-
zenship demands. It will leave its members
free to cast their ballots as they see fit,
oppose all anarchical teachings, discounte-
nance and repudiate demagogism, promote
co-operative distribution and encourage tem-
perance, thrift and self-improvement. It
should open the mechanical trades to young
men under a reasonable apprenticeship sys-
tem, and ally itself as much as possible with
the business interests of the country. It
should oppose all class legislation, by whom-
soever demanded, and commit itself to
nothing in the way of economic or financial
dogmas, leaving those to the political par-
ties which are sure to divide on every ques-
tion of sufficient importance to furnish
materials for an issue.

There is nothing impossible in such an
organization. The materials for it exist in
every industrial center. The trades unions
and the Knights of Labor together do not
probably comprise 10 per cent. of those
working for wages. Of their present mem-
bership, a very large percentage is held for
no other reason than that an individual can-
not safely maintain an independent position
where the unions control, and there is no pro-
tection through association for those who
might venture to disregard the dictation of
the union leaders. We believe that if a
hundred intelligent and thoughtful men
should form a labor organization such as we
have described it would grow more rapidly
than the Knights of Labor have grown,
and that for the defense of deserving work-
men against union tyranny any amount of
money would be cheerfully contributed by
citizens who could derive no personal benefit
from it. Such an organization has become
necessary: it only needs a leader. Men of
intelligence, with the instincts of good
citizenship, cannot afford to share with the
dangerous classes the responsibility for such
happenings as have disgraced the cause of
labor as represented by its great unions and
societies. Labor needs protection against
the King Stork it has invoked, but it must
take the initiative if it would be emanci-
pated. The opportunity is a great one, if a
great leader can be found who is equal to it.

The Chicago Failures and the Inter- state Commerce Act.

The recent failures of large barbed-wire
manufacturing concerns at Chicago has
brought prominently forward the question
of the effect of the Interstate Commerce
act on the interests of the manufacturers
of that locality. A strong effort is being
made to ascribe these failures directly to
the effects of the new freight rates which
have been established by the railroads under
the provisions of this act. It would, no
doubt, be agreeable to those opponents of
governmental regulation of railroads to be
able to say without fear of contradiction
that these failures may be regarded as
caused by act of Congress, and not by any
reason inherent in the management of their
business affairs. The judgment of an indi-
vidual is so often influenced by his prejudice
that in too many cases he does not stop to
think what may be the effect of placing the
sole responsibility for a commercial disaster
upon a law which is in active operation.

In this particular instance the new freight
rates established by the railroads have prob-
ably played some part. It must be remem-
bered, however, that for many months the
condition of the barbed-wire trade has been
far from satisfactory, owing to excessive
competition among manufacturers for busi-
ness. Some time ago we published a review
of the barbed-wire trade of 1886, which
showed very plainly that during the whole
of that year this important branch was in a
very demoralized condition. Since the be-
ginning of 1887 matters have improved to
some extent, but hardly sufficient to enable
firms which had suffered heavy losses in
times past to recoup. Concerns that found
themselves owing large sums of money on

the 1st of April were undoubtedly in condi-
tion to be seriously affected by a sudden
checking of trade, such as has resulted since
the adoption of the new freight rates. The
barbed-wire business has not suffered from
this cause more than any other branch of
trade, and all manufacturing establishments
which were solvent on the 1st of April have
been able to endure this curtailment of busi-
ness without serious results. It has been
very annoying to many of them, but in view
of the immense volume of trade transacted
during the months of February and March
the complaints over the changed condition
of business have not been very loud or far-
reaching, most manufacturers looking for-
ward to an early resumption of the buying
movement and a good condition of business
for the remainder of the year.

As to the effect of the Interstate Com-
merce act upon the business of Chicago,
merchants' and manufacturers' opinions
vary greatly, according to the individual.
It will be found on interviewing a number
of firms in the same line of business that
some of them will complain that part of
their usual trade has been diverted in other
directions on account of excessive freight
rates, while others confidently assert that
they have experienced no ill effects, but are
doing as well as they expected to do. Even
where a manufacturer or merchant has
suffered the loss of some of his trade, he
finds that he has been partly compensated,
at least, by being enabled to reach into terri-
tory from which he had previously been shut
out. The extent of the changes thus going
on is, of course, not so apparent now as if
trade were normally active. A month or
two hence a very much better idea of the
situation can be obtained than at present,
so soon after the new rates have been put
into effect. It would be very injurious to
the manufacturing interests of Chicago if
the assertion that these recent failures are
entirely due to the Interstate Commerce act
were accepted without question. The point
would naturally arise immediately, How many
other manufacturing establishments in Chi-
cago and its vicinity have been virtually in-
jured by the same cause, and will be obliged
at an early day to suspend payment? If
this were the case to any considerable ex-
tent a panicky feeling would be developed
among the manufacturers of Chicago, and
their creditors would be disposed to take
summary measures to protect themselves.
There is no greater reason for anticipating
further trouble among Chicago manufactur-
ers than among the manufacturers of any
other section of the United States. So far
as the location is concerned, they find they
are as well situated for receiving material,
manufacturing it and marketing it as the
manufacturers of any other sections. The
effort to bring the manufacturers of Chicago
and its vicinity into disrepute on account
of the failure of these barbed-wire establish-
ments is uncalled for and exceedingly injudicious.
The Interstate Commerce act may be guilty
of all the evil that has been attributed to it
in the last 40 days, but it is entirely wrong
to attack through it the solvency of impor-
tant manufacturing interests in a particular
section of the country.

The Advance in Tin.

Tin, which opened the year at £100 in the
London market and during the first four
months remained comparatively steady, sud-
denly took a decidedly upward turn toward
the close of last month, when it stood £102,
improving another £3 during the first fort-
night of the present month. The advance
has mainly been brought about by manipu-
lation in the London market, but to a certain
degree finds its support in the good statisti-
cal position of the metal, the visible supply
in Europe and America on the 1st inst.
being 11,210 tons, against 13,047 tons a year
previous. Last year the United States con-
sumed 13,000 tons, which was between 1500
and 2000 tons more than in 1885, and since
then the same ratio of absorption has been
kept up. The net import during the first
nine months of the fiscal year has been
10,919 tons, against 9414 tons during the
corresponding period of the year before.
American consumption being on the increase,
our market has been more closely watched
for the past eight months than was formerly
the case, and the London manipulators have
frequently shaped their course accordingly,
availing themselves of any momentary short
supply on this side to put up the market.
The profits to be derived from these man-
euvers have, on the whole, not answered
expectations, our dealers taking good care to
provide for current and prospective require-
ments all along.

Some of the London speculators, on per-
ceiving that not much was to be accom-
plished here either for a fall or rise, availed
themselves of the noise made about the
formation of the Salamanca Tin Company
last week—an English concern, with £225,-
000 capital—in order to sell 1000 tons of tin
short over there. According to the asser-
tions made for speculative purposes as to the
value of the Salamanca tin mines, and those
still belonging in the same locality to a
Dresden syndicate of German capitalists,
who sold the above mines for £160,000, a
great tin production at short notice is in
prospect in that peninsula. Others, who
declare themselves more familiar with the
subject, do not expect returns sufficiently
large to influence the tin market adversely
for some time to come. A couple of Conti-
nental firms, on the strength of this latter

view, had meanwhile entered the market,
operating in London for a rise and buying
some 800 tons, thereby compelling the shorts
to cover and causing the rebound of alto-
gether £5 up to the middle of May. Since
these latter parties operate in concert and
are represented to be financially very pow-
erful, there is no saying to what figure tin
may be driven under the circumstances.
Considering that the position of the metal is
undoubtedly statistically sound, the move-
ment is taking place at a time when specu-
lation generally has been getting rampant once
more, as is shown by the late gigantic oper-
ations in wheat, cotton and coffee between
Europe and America.

We are evidently on the eve of an era of
speculation in the merchandise market from
the moment the conviction has become gen-
eral that peace on the Continent is not likely
to be disturbed during the remainder of
1887. Any leading articles capable of being
controlled, at least for a while, and which
can be dealt in on paper like those we have
named, may therefore be taken hold of, pro-
vided their statistical position possesses
some elements of strength. Last year the
speculation was confined to India rubber,
wool and coffee. This year there are indi-
cations that it will take a wider scope with-
out perhaps precisely culminating in a gen-
eral boom. Much as speculation may have
to be deprecated—if we view it from the
standpoint of legitimate consumption—it is
at any rate preferable to the slough of des-
pond into which the world's commerce had
drifted during 1884 and 1885, when the gen-
eral decline in the value of raw material
seemed to have no bottom to it.

Our Bessemer Pig Capacity.

We had occasion last week to criticize
adversely statistics prepared by *Bradstreet's*
concerning the production of Bessemer pig
iron in this country. Our contemporary
then proudly announced that its "reports of
Bessemer production received are believed to
include all producers of note, with the
single exception of the Cambria Com-
pany, Johnstown, Pa." Then our contem-
porary enumerated 92 furnaces; now it
has swelled the total to 103, and its total
weekly capacity has risen from 55,512
gross tons to 63,608 gross tons. By its
own confession, then, its figures were far
from being complete. We challenged
the figures in the case of a few of the States
enumerated, choosing them simply because
that was all that was necessary to impeach
their accuracy. If our contemporary was
wrong in cases where there were few fur-
naces, the status of which the majority of
the trade could easily check, it did not re-
quire a lengthy analysis of its data for the
most important State, Pennsylvania. *Brad-
street's* admits that it was wrong in not in-
cluding all the Ohio furnaces and in leaving
out one of the New Jersey furnaces, and it
has changed its figures for Wisconsin. The
mysterious seven "miscellaneous" furnaces
turn out to be one Colorado and three
Southern furnaces: the others related to
works whose reports were received too late
to be properly classified. It is a manifest
absurdity to publish a table in which a part
of the figures are specifically grouped geo-
graphically and then tuck a part away under
"miscellaneous." A reader desirous of know-
ing what the Bessemer pig capacity of Penn-
sylvania was would, according to *Brad-
street's* first table, be forced to reason thus:
Capacity in April, 25,480 tons, plus a quan-
tity, unknown to me, of the "miscellaneous."
When in January we estimated the make of
Bessemer pig, we distinctly stated the diffi-
culties attending the compilation of figures
relating to this particular industry, and in
order to allow the trade to judge for itself
we enumerated the furnaces then running on
that grade. One of the principal unknown
factors was the proportion of iron made by
the Cornwall group of furnaces which was
diverted to steel manufacture. Some of
them work entirely for that grade, but all
of them do not. Unless *Bradstreet's* is pre-
pared to state that it has specific informa-
tion on this point, it has not the right to
confidently put forward totals worthy
of being a guide to the trade. Our con-
temporary implies that we have attacked
its special statistical effort for selfish
reasons. We have been actuated solely by
the desire to guard against the danger that
might grow out of the acceptance by the
trade of statistics compiled with so little
acquaintance with the facts.

Bradstreet's seeks to avoid the responsi-
bility for its figures by assuming the position
that the office of a statistician is that of a
mere compiler of data sent by producers;
that he has not the right and should not
undertake to "go behind the returns." It
takes the ground that an attack upon its
figures is equivalent to throwing doubt upon
the veracity of the iron makers. The fact
is, that replies may be honestly made, and
yet the data cannot be accepted by a statis-
tician without modification. No one who
has any experience in collecting statistics of
capacity has failed to observe that, at the
same time, different officers of the same cor-
poration put forward widely different esti-
mates of the capacity of their plant. Another
point, apt to cause estimates of weekly out-
put to be excessive, is that those reporting
take the monthly output as the basis, and
divide by four to get at the weekly make,
thus adding unintentionally from 7½ per
cent. to 10 per cent. Dealing with the
capacity to produce Bessemer pig, it should

be taken into account, too, that one par-
ticular day may happen to indicate a largely
increased make, while a few days later the
blowing out of one or two of the modern
furnaces, with their weekly output of 1000
to 1500 tons, may entirely reverse matters.

In support of its position, our contem-
porary quotes some comments made by us
lately when dealing with the new furnaces
and steel works building. The remarks al-
luded to dealt with the changes likely to
follow a heavily increased make of foundry
and mill grades in the South. One of the
principal changes we then contended would
be to make Ohio and Western Pennsylvania
furnaces go over to Bessemer, for which
there would be a growing demand, owing to
the large number of new steel works build-
ing. As the increase in the South will not
be keenly felt until late in 1887 and early in
1888, it is difficult to see how our remarks
could be made to deal with the present
position. That there has been a considerable
increase in the make of Bessemer pig
no one will question, but we believe that the
larger product is called for by the heavier
output of the rail mills. *Bradstreet's* figures
appear very encouraging to makers of
foundry and mill grades, since they would
show that practically there has been no in-
crease in them since the opening of the year.
But its returns are well calculated to thor-
oughly frighten the outside makers of Bes-
semer pig.

Crossing the Continent.

The recent diversion of traffic to a consid-
erable extent from the United States continental
routes to the Canadian Pacific Railway again
brings conspicuously into notice the fact that
a great rival thoroughfare has been estab-
lished just across our northern boundary.
The fourth section in the Interstate law
enables the Canadian Pacific route to bid
successfully for the transportation of wool
grown in California and sugar imported from
the Sandwich Islands, and this despite a
considerable advance in rates by way of
Canada. Although the Canadian Pacific
was open for through traffic only for the
last five months of 1886, no less than seven
cargoes of tea and other commodities from
China and Japan, consigned principally to
firms in Chicago, St. Paul and New York,
were received at the Pacific terminus, and
forwarded to their destination, and accord-
ing to present expectations three steamers
recently in the Cunard service will be run-
ning regularly between Vancouver, Yoko-
hama and Hong Kong. The annual report
of the Canadian Pacific Railway Company,
submitted to the shareholders in Montreal
on the 11th inst., represents that the entire
main line from Montreal to the summit of
the Rocky Mountains is in a satisfactory
condition, the experience of the past winter,
the most severe for many years, having
shown, however, that the snow sheds system
must be more extended. The financial situ-
ation, as to assets, liability and prospects,
appears to be satisfactory.

The gross earnings for the year were \$10,-
081,803, the working expenses (63.26 per
cent.), \$6,378,317, leaving net earnings (36.74
per cent.), \$3,703,486. Deducting fixed
charges, \$3,068,041, there is left a surplus
of \$635,444. The total assets of the com-
pany at the end of 1886 amounted to \$226,-
405,231, including 14,959,718 acres of land
valued at \$2 per acre. The total liabilities,
including capital stock, funded debt, ac-
counts payable and land grant bonds out-
standing, amounted to \$117,099,515, leaving
a nominal surplus of assets over liabilities
of \$109,305,716. The earnings for three years
are stated as follows: 1884, \$5,750,000;
1885, \$8,368,000; 1886, \$10,081,000. Some
accessions of freight traffic are expected from
the copper mines discovered at Sudbury
Junction, where smelting furnaces are being
erected, and it is hoped that extensive iron
deposits and mines of anthracite and bitu-
minous coal opened between Calgary and the
summit of the Rocky Mountains will be soon
developed.

On the 1st of July, when the St. Lawrence
bridge and connections are finished, the
Canadians will have "the shortest possible
line to the Atlantic Seaboard," via the Bos-
ton and Lowell. Before the next annual meet-
ing, says the report, Canadian Pacific trains
will run from Halifax to Vancouver; the
Sault Ste. Marie branch connecting with
Duluth, Minneapolis and St. Paul will
be opened; the Boston line affording
connections with all New England will
be fully established; "and it is ex-
pected that the Ontario and Quebec, which
is of almost equal importance to the main
transcontinental line itself, will have secured
an independent working connection with
Chicago and the United States, making a
new trunk line between Chicago and the
Atlantic seaboard at least equal to its older
competitor." The establishment of a direct
steamship line to Europe is now being con-
sidered by the Dominion Government.

As appears from the foregoing, a grand
commercial and engineering enterprise,
which is entitled to rank high among
modern achievements, is nearing completion.
Whether the returns will justify the enor-
mous outlay remains to be seen. It is
claimed that success, commercially, is fa-
vored through the operation of the Inter-
state law, of which the Dominion authorities
hasten to take advantage. It remains to be
seen on what basis freight charges on the
five American transcontinental lines will
finally be adjusted. Our transcontinental

lines certainly have an aggressive rival, who will seek business with all the eagerness of a newcomer, especially during the earlier part of its career, before the traffic in its own exclusive territory is in the first stages of development.

New Sources of Coke Supply.

The peculiar condition of affairs in the Connellsville coke region causes much uneasiness among Western furnacemen, apart from the immediate consequences of existing labor troubles. It is believed that in view of the increasing manufacture of pig iron in Ohio, Illinois and Missouri, it is unwise to depend entirely for furnace fuel upon a locality so limited in extent and so much at the mercy of a force of turbulent and easily disaffected workmen. Several times in the past manufacturing operations in the West have been vexatiously interfered with at most inopportune periods by a suspension of operations in the coke region through causes which were entirely beyond the control of the suffering consumers. And, again, the gradual union of the Connellsville coke producers in an unyielding combination to control production and prices has not been without its effect upon these manufacturers using coke, among whom competition in the sale of their own products is necessarily unrestricted. A frequent shortage of cars is another grievance visited upon Western consumers of the coke of this region, although that is the fault of the carrying companies and not of the coke producers. All these troubles taken together, however, cause Western consumers of coke to constantly feel more or less anxious about their supply of this fuel, notwithstanding the great productive capacity of the Connellsville region and the high character of the coke made there.

It is not strange, therefore, that other sources of supply than the Connellsville region have been diligently sought for. Unfortunately for Western consumers no nearer deposit of coking coal has yet been discovered, but developments have been made in localities which are very little, if any, further away. West Virginia and Eastern Kentucky contain large deposits of such coal, and to those States the hopes of Western furnacemen turn, with at least the expectation of the early development of a coke supply which will supplement and in time compete with that of Southwestern Pennsylvania. A small quantity of West Virginia coke has for some time been regularly shipped to Ohio and Illinois furnaces, but not in sufficient abundance to meet the requirements of heavy consumers if the supply of Connellsville coke were completely withheld.

Arrangements are now being made for the manufacture of coke in West Virginia upon a more extensive scale. A lack of capital has hitherto hampered the operators in that section, but steps have been taken to provide the necessary funds for an important extension of existing plant, and it will not be long until West Virginia coke will fill an important function in meeting the wants of Western furnacemen. The coking coal of Eastern Kentucky has been thoroughly examined and carefully tested, and it is now known to be of equal value with Connellsville coke. Some analyses of the new coke have even given better results, the contents of carbon being greater, while the ash is smaller. It has not yet been put upon the market, for lack of railroad communication, but this want will be supplied before the close of the present year. Ample capital is then assured for the development of the new coke region, and arrangements are already being made for that purpose. Iron ore of remarkable richness and purity abounds in the immediate vicinity, and ultimately furnaces may be erected to smelt it, but at present the indications are in favor of the development of the coke resources of the district.

It is not expected and it may not be desirable that Western consumers will completely turn aside from the Connellsville region. The necessities of the country may be such in a few years that every coke oven will be called upon to furnish its quota, and West Virginia and Eastern Kentucky may be heavily taxed to supply furnaces nearer than those of Ohio and Illinois, but in the meantime relief will be persistently sought from the annoyances which now attend dependence upon this single locality.

The dullness in trade has not affected all branches of business in the same degree. The manufacturers of machinery are in many cases far behind in their deliveries, disappointing purchasers who fully expected to be supplied weeks ago. In one case, a large engine was delivered to a Chicago manufacturer in May, which was under contract to be put in place in November, and the builder of the engine has one of the largest and most complete establishments in the country. Other cases equally indicative of the pressure for engineering work are coming to light daily. A Chicago iron merchant, whose orders have been very light for a month, and was therefore inclined to think that the bottom had fallen out of business, was greatly surprised last week when he tried to place an order for some castings and had very great difficulty in finding a foundry able to take the contract for reasonably early delivery. The consumption of iron goes on at an enormous rate, and the wheels of industry are not seriously clogged.

The decline in the price of copper has shown the famous Spanish and Portuguese pyrites mines of much of their past glory as dividend-payers. Rio Tinto, as was an-

nounced by cable by an English correspondent two weeks since, has declared a dividend of only 3 per cent., against 5½ per cent. in 1885, 8 per cent. in 1884 and 14 per cent. in 1883. The Tharsis Company, which for twenty years yielded an average profit of 19¾ per cent. distributed 27½ per cent. in 1883, declined to 20 per cent. in 1884, dropped to 10 per cent. in 1885, and for 1886 its shareholders must be content with a modest 7½ per cent. The Mason & Barry Company paid only 2½ per cent. in 1886, against 3¼ per cent. in 1885, 8 per cent. in 1884 and 12½ per cent. in 1883. As these three companies represent an annual output of about 100,000,000 pounds of copper, their financial returns possess much significance. All of them are driving ahead at maximum capacity, and not one of them will voluntarily reduce their output. In spite of their lessened returns to their shareholders, they have shown their capacity to produce at current figures and carry the enormous bonded indebtedness of some of them. The only salutary effect of the lower dividends is effectually to keep capital from going into Spanish pyrites mines for the present.

Our English correspondent reports this week the accomplishment of a reform in the warrant system, so far as it applies to the Cumberland hematite pig district, which is not without interest to Americans. Hitherto it was optional with the storekeepers to deliver any brand to holders of warrants who called for the iron. Now warrants may be issued for any given brand of pig iron stored, so that buyers can secure just what they want. This we take it was intended to, and it will accomplish that end, to facilitate the operations of consumers. It is likely that this step was not taken without reference to buyers on this side of the Atlantic and on the Continent, the majority of whom are quite familiar with the leading brands, and who, therefore, will find additional inducement to cover on contracts by carrying warrants calling for the very iron they want.

Long and Short Hauls.

The wording of the celebrated fourth section of the Interstate Commerce law makes it clear to the student that Congress intended that this part of the law should have sufficient elasticity to prevent the destruction of business interests where there was good reason geographically and industrially for their protection. At the same time there seems no reason to doubt that the justice of the principle of the long and short haul clause in its general application was clear in the minds of our legislators. In support of this view of the correctness of the general principle we have high railroad authority. Mr. Charles Francis Adams, president of the Union Pacific, in an address delivered in Boston, March 19, said:

"I have always maintained that the unequal competition of railroads was a great evil. It had the necessary tendency of concentrating business at given points and in a few hands. The geographical point which did not have the advantage of railroad competition could not hold its own against the point which did have that advantage. So also the man who controlled a small business could not hold his own against the man who controlled a large business. The traffic of the large shipper would always be sought for on terms more advantageous than the small shipper could command. As a commissioner I always maintained that this was wrong; as a railroad president I maintained that it is wrong to-day. Therefore, I am by no means prepared to admit that the Interstate Commerce bill is likely to produce any serious or injurious results when it says that no railroad company shall charge more for a long haul than it does for a shorter haul, which is included in the longer haul under conditions substantially the same. I want to see this provision of the act brought into practical operation. I am not afraid of it. It is substantially just, and where a thing is substantially just it is right, and where it is right it should be law."

The majority of our business men are agreed that this prohibition of a greater aggregate charge for a shorter and for a longer distance should be suspended when the necessities of ocean competition compel it. The roads from New England to Mobile and New Orleans run through a thinly settled country and must compete at both ends with steamship lines. The rates between these terminal points are thus fixed for them. It is the question, then, whether interior rates should be based upon this water competition. Now we hold, to put it briefly, that it is the true policy of a railroad to overcome natural advantages, and that, so far as these railways are physically able to do so, they should put Atlanta, Ga., upon an equal footing with New Orleans. Whether it would be right to compel them to do this is largely a question of income. If the roads are honestly capitalized; if they are economically managed; if they are earning a fair return only upon the investment, it may be conceded that higher rates to the interior towns are justified. The next question to determine is, What should the advance be in charges over the coast cities? Heretofore the railroads have been the sole judges of this matter, and it is well known that in many cases their power has been used in demanding a difference in freights not warranted by the difference in circumstances. An instance often referred to is that of cotton. The rate from Winona, Miss., an inland town, to New Orleans, was three times the charge upon the same article from Memphis to New Orleans, a greater distance away. The latter city had water communication by the Mississippi River, and thus the rate was low. The Illinois Central Railroad claimed that it could not afford to carry the Winona cotton at any less, and that the rate from Memphis was not of their making. Their statement was true as to the latter, but as to the interior rate it was vigorously disputed. Three times the aggregate charge for a shorter distance was certainly a great drawback to the prosperity of all interior villages. If the roads were left to be the judges and no

limit were put upon the inland freights, a time would come when the traders of Winona must move to the river towns. It was the intention of the law that such discriminations as these between cities with water advantages and those inland should not be allowed unless the necessity for their existence could be most clearly shown. If it be granted that these differences could not be avoided in many cases, it is difficult to see why the railroad company should object to showing the proofs before an impartial tribunal. The commissioners have carefully investigated the facts of the matter as regards the Southern States, and their conclusions may soon be known.

There is a certain feeling of uneasiness in the minds of many of our merchants lest the suspension granted the South and the Pacific should also be applied to the great lines north of the Ohio and Missouri rivers. In the English courts it has been decided that competition is not of itself a sufficient cause for discrimination between persons or places. It would be well to bear this in mind regarding the roads mentioned. The fact that many of the roads in the territory named directly compete with carriers on lakes, canals and rivers is not of itself sufficient to demand a suspension of the fourth section. Under our theory, if they can compete with their water rivals, they should do so. Even where a suspension of the rule would be just, the case should always be open for further examination, so that as traffic increases no injustice may be perpetuated upon the interior cities. What we have said regarding the long and short haul question in the Southern States applies also to the traffic to and from the Pacific Coast, although it should be remarked here that from too much caution, or for other reasons, the transcontinental lines, in adapting their rates to the requirements of the new law before its temporary suspension, increased them unnecessarily. The food products of California must be sold in Eastern markets in competition with foreign imported fruits, &c. Their selling price in the Eastern market is thus fixed, and freight rates should be arranged accordingly. To this the law offers no objection, for there is no short haul in the question. Salmon is packed only on the coast—no interior salmon competes with it. This being the case, there is nothing to hinder the putting of such a special commodity rate on salmon as the business demands. The like statement is true of raisins which come to the East only from California, and, if raisins were also grown and cured upon the interior valleys, these latter would be put in the same footing in the Eastern markets, since they would compete with the same Spanish importations. These two illustrations will justify the statement that the great increase which was made in Pacific Coast rates was in many cases without need, even before the suspension of the law.

We have directed our attention to the question of the long and short haul as affected by water competition. There is, however, another discrimination between inland places which has been growing in favor of some of our associations, by which the rates to a nearby but local station were higher than to a distant though competitive point. An instance of this can be taken from the North West—Red Wing, Minn., Faribault, Minn., and other similar towns which once had flourishing grain mills. Their prosperity received its first blow when the local rates from these places to Chicago were made higher than from the more distant but competitive city of Minneapolis. It cannot be doubted that discriminations of this character were intended to be forbidden by the new law, and we do not believe that the commissioners can be induced to favor their continuance.

New Birmingham Projects.

In his report to the stockholders of the famous Elyton Land Company, of Birmingham, Ala., the president, Dr. H. M. Caldwell, put forward the following suggestions on the policy of that corporation:

A short time ago, your company, by its aid, secured the erection of the Williamson furnace. You have long since had returned to you every dollar of the money which you put into it, and the stock which you received for the land upon which it is located has doubled in value. The same operation can be repeated in many directions and to an indefinite extent. We have in Birmingham one of the finest and best equipped rolling mills in the country, which, for 12 months past, has been unable to supply the demand for its products. Some of the industries of Birmingham using rolled iron have been compelled to send to Pittsburgh for it, because it could not be supplied here. Suppose the Elyton Land Company determines to erect another rolling mill. We purchase the best and most improved machinery, employ a first-class manager to take charge of it, and let him employ his corps of operatives, and announce to them that the entire profits above a reasonable per cent. upon the capital invested will be divided annually among the employees. By this means you interest, directly, every employee in the success of the enterprise, and avert all danger of strikes. So soon as the success of the enterprise is assured, the stock can be sold for all or more than its cost. Build also a stove foundry, locomotive works. If this is done, and done properly, it will soon increase the population of Birmingham to one hundred thousand, and double the value of your property, possibly, without the loss of one dollar to you.

The question for you to decide is whether the Elyton Land Company can afford to loan, say one million or more, in order to increase the value of your real estate one hundred per cent., as well as add as much to the value of your water works and railroad investments, and make for yourself the name of being the most progressive and public spirited corporation that has ever blessed the South. Should this convention adopt strong resolutions announcing to the world that the Elyton Land Company have determined to sustain Birmingham by inaugurating some such scheme as suggested, it would effectually remove all doubt from

the minds of the public that here was to be the great industrial center of the South. It would at once establish confidence, and enhance the value of your property more than the entire amount the works would cost you.

The New Canadian Tariff.

The following are the principal changes in the Canadian tariff proposed by the Minister of Finance. According to dispatches received by us from Montreal, the new duties are in force, but are subject to alteration before permanent adoption:

Advertising calendars and almanacs, 6 cents per pound and 2 per cent.

Braces, &c., 35 per cent.

Buttons, vegetable ivory and horn composition, 10 cents gross and 35 per cent.; all other, 25 per cent.

Buggies, farm wagons, farm, railway or freight carts, pleasure carts or gigs costing less than \$50, \$1 each and 20 per cent.; costing \$50 and less than \$100, \$15 each and 20 per cent.; and all costing \$100 and over, 35 per cent.

Sewing machines, \$3 specific and 20 per cent.

Plated knives, costing under \$3.50 a dozen, 50 cents a dozen and 20 per cent.; all other electro-plated ware, 30 per cent.

Plumbago, 10 per cent.; manufactures of plumbago, 25 per cent.

Salt, coarse, 10 cents; fine, in bulk, 10 cents; in bags or barrels, 15 cents per 100 pounds.

Sand, glass, flint and emery paper, 30 per cent.

Chopping axes, \$2 a dozen and 10 per cent.; broad and ship axes, adzes and hammers, weighing 10 pounds and over, \$3 per dozen and 20 per cent.; all others and hay knives and four and five prong forks, \$2 per dozen and 20 per cent.

Hoes, garden rakes, two and three prong forks, picks and mattocks, \$1 per dozen and 20 per cent.

Shovels and spades, \$1 per dozen and 20 per cent.

Mowing machines, harvesters, reapers, sulky and walking plows and other agricultural implements not elsewhere specified, 35 per cent.

Wrought scrap iron and scrap steel, being waste or refuse, wrought iron or steel that has been in actual use and fit only to be remanufactured, \$2 per ton.

Ferromanganese, ferrosilicon, speigel steel, bloom ends and crop ends of steel rails for the manufacture of steel, \$2 per ton.

Iron in pigs, iron kentledge and cast scrap iron, \$4 per ton.

Iron in slabs, blooms, loops, puddle bars or other forms, less finished than iron in bars more advanced than pig iron (except castings), \$9 per ton.

Bar iron, rolled or hammered, comprising flats, not less than 1 inch wide nor less than ¾ inch thick, \$11 per ton.

Round iron, not less than ¾ inch in diameter, and square iron, not less than ¾ inch square, \$13 per ton.

Flats less than 1 inch wide, or less than ¾ inch thick, round iron less than ¾ inch and not less than ¾ inch in diameter, \$15 per ton.

Rolled round iron in coils or rods, less than ½ inch in diameter, and bars and shapes of rolled iron not elsewhere provided for, 25 per cent.

Iron or steel, rolled round wire rods under ½ inch in diameter, when imported by wire manufacturers for use in their factories, 5 per cent.

Iron and steel wire, galvanized or not, smaller than 5 gauge and not smaller than No. 15 gauge, 20 per cent.

Wire of spring steel, coppered or tinned, No. 9 gauge or smaller, 12½ per cent.

Boiler or other plate iron, sheared or steel, not specially enumerated or provided for, 30 per cent., provided that on all iron or steel bars, rods, strips or steel sheets of whatever shape, and on all iron or steel bars of irregular shape or section, cold rolled, cold hammered or polished in any way in addition to the ordinary process of hot rolling or hammering, there shall be paid one-sixth of 1 cent per pound in addition to the rates imposed on said material.

Malleable iron castings and steel castings, not elsewhere specified, \$25 per ton, provided the duty shall not be less than 30 per cent.

Cast-iron vessels, plates, stove plates and irons, hatters' irons, tailors' irons and castings of iron, not elsewhere specified, \$16 per ton, provided the duty shall not be less than 30 per cent.

Cast-iron pipes of every description, \$12 per ton.

Iron or steel axles, parts thereof, axle bars, axle blanks or forgings for axles, without reference to the stage of manufacture, \$30 per ton, but not less than 35 per cent.

Engines, boilers and machinery, viz.: Fire engines, 35 per cent.; locomotives and other steam engines, boilers and machinery, composed wholly or in part of iron or steel, not elsewhere specified, 30 per cent.; portable machines, portable steam engines, threshers and separators, horse-powers, portable saw mills and planing mills and parts thereof in any stage of manufacture, 35 per cent.; locomotive tires of Bessemer steel in the rough, 10 per cent.; boiler tubes or flues, or stays of wrought iron or steel, 15 per cent.; wrought iron tubing—plain, not threaded, coupled, or otherwise manufactured, over 2 inches in diameter—15 per cent.; other wrought iron or steel tubes or pipes, 30 per cent.

Safes, doors for safes and vaults, scales, balances and weighing beams of iron or steel, 35 per cent.

Skates, 20 cents per pair and 30 per cent. Wire rope of iron or steel, not otherwise provided for, 25 per cent.

Sledges, track tools, wedges and crowbars of iron or steel, 1¼ cents per pound and 30 per cent.

Hardware, viz.: Builders', cabinet makers' and carriage hardware and locks, 35 per cent.

Muskets, rifles and other firearms and surgical instruments, 20 per cent.

Nails and spikes, wrought and pressed, galvanized or not, and wrought iron or steel

nuts and washers and horse, mule or ox shoes, 1½ cents per pound.

Horseshoe nails, hob nails, wire nails and all other wrought iron or steel, not elsewhere specified, 2½ cents per pound.

Cut tacks, brads or springs, not exceeding 16 ounces to the thousand, 2 cents per thousand; exceeding 16 ounces to the thousand, 2 cents per pound.

Iron or steel rivets, bolts with or without threads or nuts or bolt blanks, and finished hinges or high blanks, 1¼ cents per pound.

Cut nails and spikes of iron or steel, 1 cent per pound.

Street railway bars or rails, weighing not less than 25 pounds per lineal yard, for purposes other than railway tracks, \$9 per ton.

Manufactures, articles or wares not specially enumerated or provided for, composed wholly or in part of iron or steel, and whether partly or wholly manufactured, 30 per cent.

Printing presses of all kinds, folding machines and paper cutters, 10 per cent.

Unsheared skelp iron, sheared or rolled in grooves, and sheet iron, common or black, not thinner than No. 20 gauge, not elsewhere specified, \$10 per ton.

Sheet iron, common or black, smoothed or polished and coated or galvanized, thinner than No. 20 gauge, Canada plates and boiler plate of iron or steel, not less than 30 inches wide and valued at not less than 1½ cents per pound, 12½ per cent.

Hoop or band or scroll or other iron, 8 inches or less in width, and not thinner than No. 20 gauge, \$13 per ton.

Hoop or band or scroll or other iron, 8 inches or less in width, and thinner than No. 20 gauge, 12½ per cent.

Iron railway bars, steel T rails, weighing not over 25 pounds per lineal yard, iron or steel flat rails, punched, and iron or steel railway fish plates, \$9 per ton.

Rolled, channel, sand, angle and T iron and rolled eyebars, blanks made by the Kloman process, when imported by manufacturers of bridges for use exclusively in their own manufactures, 12½ per cent.

Iron bridges and structural ironwork, \$25 per ton, provided that the duty shall not be less than 30 per cent.

Forgings of iron and steel or forged iron of whatever shape or in whatever stage of manufacture, not elsewhere specified, \$30 per ton, provided that the duty shall not be less than 35 per cent.

Steelingots, cogged ingots, blooms and slabs by whatever process made, billets and bands, hoops, stripes and sheets of all gauges and widths, all of above classes of steel, not elsewhere provided for, valued at 4¢ or less per pound, 30 per cent.; but not less than \$10 per ton; when of greater value than 4¢ per pound, 12½ per cent.

ADDED TO THE FREE LIST.
The following articles are added to the free list: Firebrick, anthracite coal, gannister steel rails, weighing not less than 25 pounds per lineal yard, for use in railway tracks; steel valued at 2½¢ per pound and upward, for use in the manufacture of skates; scrap iron and scrap steel, old and fit only to be remanufactured, being part of or recovered from any vessel wrecked in waters subject to the jurisdiction of Canada; steel bowls for cream separators; steel for the manufacture of files, when imported by file manufacturers for use in their factories.

Steel Rivets.

To the Editor of the Iron Age: It is a pity that in your article of May 5 you did not get the whole discussion on steel rivets, because your article, as it is, may mislead persons who are not familiar with steel. Before the discussion was concluded Messrs. Lindenthal, Koch, Thatcher and myself



Fig. 1.

were agreed. The conclusion reached may be stated as follows: A rivet is made of the shape shown in Fig. 1. When it is in place it appears as in Fig. 2. It is clear that the head A has no material amount of work put upon it in the operation of riveting. It is equally clear that the head B has had a large amount of work put upon it in its forming. Now, if the rivet be of steel and the head A be heated up to, or near to,

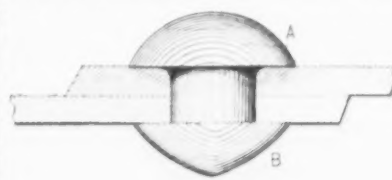


Fig. 2.

a scintillating heat by a careless heater, the grain will be "raised," and the rivet will be weak and brittle at A; but the head B, having had abundance of work, will be tough and strong. The discussion brought out the fact that in every case of failure it was the head A that flew off.

Conclusion: 1. Steel rivets are stronger than iron rivets, and they will remain stronger if the heads A be not overheated.

2. The heads A will fly off at a slight blow if they have been heated so as to "raise" the grain.

It is the "same old story"—overheat your steel, put no work on it, weaken it, and it will stay weak. WM. METCALF.

PITTSBURGH, Pa., May 9, 1887.

BUSINESS OPPORTUNITIES.

To Manufacturers.

BELOIT,
WISCONSIN.

A beautiful city of 60,000 inhabitants, located in the Rock River Valley, within three hours' ride to Chicago and Milwaukee, over competing railway lines, offers large inducements to manufacturers. Close proximity to hard and soft lumber, iron mines and furnaces; cheap coal; unsurpassed facilities for receiving and shipping by rail; lowest freight rates; no switch charges; superb water power; cheap homes; colleges, schools, churches, and all social advantages; intelligent and contented labor, male and female; best climate in the world to work in; gas and electric light; water-works sufficient for 50,000 population. For particulars address,

J. B. DOW, Sec'y.

BELOIT BUSINESS MEN'S ASSOCIATION,
Beloit, Wis.

FOR SALE, CHEAP—Small Manufacturing Site on Rock River, Beloit, Wis., frame building, 60 x 60, 200 inches water, about 20 horse power, water wheel and jack. Price, \$8000. Address J. B. DOW, Beloit, Wisconsin.

IN ORDER to give exclusive attention to and extend its manufacturing facilities for which the present location does not give room, a company long established and admirably located in a western city, at present engaged in Manufacturing and Jobbing Lumber, Gas Fitters and Steam Fitters, will dispose of all its manufacturing facilities, including all machinery and material held as dealers or jobbers of such goods, with all unfilled or accepted orders for same, existing at date of disposal. Provision for the later, if of such material as this company proposes to manufacture can be made at prices and on terms satisfactory to the purchaser if so desired. A continuance of the business without interruption and disappointment to the trade being this company's wish. Purchasers can take immediate possession of a paying business, with a grade secured. Business established 22 years; size of building, 44 x 110 inside; five floors with light on three sides; every floor available for use; entire building warmed by steam; offices large, convenient and well lighted; large brick vaults on ground, second and third floors, and entire building lighted by electricity and gas. Such permanent fixtures as Rollers, Engine, Heating and Lighting Apparatus, Power Elevators, etc., on any part of same, will be included in sale if desired. Present trade chiefly in New York, Pennsylvania, Ohio, Indiana, Michigan and Canada, with large retail trade in the immediate vicinity. Satisfactory terms of payment with reliable purchasers, and information of past and present business needed for its continuance fully and freely given. Address, in person or by letter, WORKWORTH MFG. CO., Cleveland, Ohio.

April 2, 1887.

For Sale,

For best of reasons, a clean stock of Light and Shelf Hardware and Sporting Goods that will increase about \$5000. The first store front and fitted up room of the kind in a city with a population of 45,000 and is one of the largest manufacturing and retail centers in State of Pennsylvania. Is and always has been doing a paying business and now enjoys the most lucrative trade in Hardware, Hardware, Carpentry Tools and Sporting Goods in the city. An exceptional opportunity for a young man. In the employ of the store is the best used hardware clerk in the city, hard worker, competent to run the business, in a roughing business, kind manner, in best of repair with the contractors, and working for a moderate salary. Address

"REASON,"

Office of The Iron Age, 66 and 68 Duane St., N. Y.

A PARTNERSHIP

in a first-class Retail Hardware Business, in a large manufacturing city, in New York State, is offered for sale. This is a very good opportunity for some one to connect himself with a well-established and prosperous concern. Capital required, \$12,000 to \$15,000. Full information will be given to responsible enquirers by addressing

"S. C.," BOX 101,

Office of The Iron Age, 66 and 68 Duane St., N. Y.

FOR SALE.

A MANUFACTURING PROPERTY IN DAVENPORT, IOWA. This property consists of Foundry and Machine Shop, and is admirably located, so far as labor, material and transportation are concerned, for manufacturing purposes. Desirable parties having capital or established business will receive the encouragement of local Board of Trade and citizens' society, the "Adva. Club." This is an unusual opportunity for parties desiring to establish a business in the West, where every encouragement will be given, and it is especially adapted to any branch of machine or hardware manufacture. Address

JAMES P. DONAHUE, Davenport, Iowa. Citizens' National Bank, Davenport, Iowa.

FOR SALE. Stock of Iron, Steel, Wagon and Carriage material, both iron and wood; also, large, convenient Store Room, located in growing manufacturing and now becoming city of Quincy, Ill., the second city in the state, population about 10,000; quite a railroad center, and on the great Mississippi River. Excellent traveling territory on every side; for fine rich country scarcely equalled. Business established twenty years. Money made every year. The only store of the kind in the city. Reason for retiring, bad health.

LEMLEY BROTHERS, Quincy, Illinois.

For Sale.

Foundry, 100 x 40 ft. and Machine Shop 60 x 20 ft., both with water privilege; also Japan and Packing House 60 x 22, Stove Storehouse 30 x 14 and Storehouse and Box Shop 30 x 20. All in good repair and running order; five minutes from steamboat and ten minutes from two railroad stations. Address

WILLIAM KEIGHLEY'S EST.,

Middle Haddam, Conn.

FOR SALE.

To Close an Estate. A hardware stock of \$15,000 in the best business city in Michigan. Business established twenty-five years. Address "HARDWARE STOCK," Office of The Iron Age, 66 and 68 Duane St., New York

Alabama's Mineral Belt.

Parties wishing information about or investment in Alabama Mineral, Lumber or Agricultural lands, will please address, with stamp,

EDWARDS & ARNOLD,

Tallapoosa, Ala.

Special Notices.

BUSINESS OPPORTUNITIES.

FOR SALE,

The Melvin Sewing Machine Co.'s Factory and grounds, located in Chillicothe, Ross Co., Ohio, and adjoining the depot grounds of the C. W. & B. and Scioto Valley Railroads. The main building is of brick, 133 x 33 feet; three stories, slate roof, well lighted and floors 6 in. thick. The Engine, Boiler and Japan rooms and blacksmith shop, are all of brick and covered with tin. The whole building heated by steam and lighted by electricity. It contains a 45 horse-power Reynolds-Corliss Engine, a 75 horse-power Babcock & Wilcox Boiler and Edison Dynamo, all in good condition. One house and lot and three vacant lots, all adjoining the factory grounds. This is a desirable property for manufacturing purposes, and will be sold at a bargain. For further particulars call on or address

NELSON PURDUM, Receiver,
Chillicothe, Ohio.

FORT SCOTT, KANSAS.

Attention of Capitalists and Manufacturers is called to the numerous advantages existing at Fort Scott, Kansas, which will soon make this city one of the most important manufacturing and commercial points in the West, and enable it to maintain its present supremacy over all other cities in this State. The natural facilities are unequalled. Coal of the best quality is sold at \$1.50 to \$2.00 per ton; stack, 50 cents to \$1 per ton, delivered. Abundance of stone and brick, best quality. Natural gas is fully developed and used for all purposes. Facilities for transportation and distribution are unequalled, being at the junction of five trunk railways. Direct communication with lumber regions of Missouri and Arkansas. Correspondence solicited.

SECRETARY BOARD OF TRADE.

BESSEMER STEEL COMPANY, Ltd.,
Office, 218 S. Fourth St.,

PHILADELPHIA, December 1, 1886.

A demand for steel blooming mills of small size having arisen, we have decided to grant license for movable feed mills having driven feed rollers under the George Fritz patent, No. 123,771, dated December 10th, 1872, hereafter, with reference to the product of the mill.

Licenses will therefore be granted under the said patent for mills heretofore erected and put into use upon the payment of \$1000 down and a royalty of ten cents per ton for all metal rolled thereon in excess of 50,000 tons in any year.

These terms are extended only to mills heretofore erected by persons procuring licenses before said mills are put into use.

All infringers of this patent will be vigorously prosecuted.

JOHN M. KENNEDY, Secretary.

FOR SALE.

The Old Colony Iron Co., of Taunton, Massachusetts, offer for sale their Rolling Mill Nail Factory, Machine Shop, Foundry, Cooper Shop, Lands and Tenements, situated in the town of Somerset, on the Taunton River, 4 miles above Fall River. Said mill contains Double Puddling Furnaces, Scrap Furnace and 4 Heating Furnaces, 1 Squeezer, Rolls, and all the necessary apparatus for converting the product of said furnaces into nail plates. The Nail Factory contains 50 Nail Machines, with a capacity of cutting all the plates the mill rolls.

The above property is situated on a wharf where vessels drawing 15 feet of water can discharge coal and iron directly to the mill.

They also offer for sale their Tack Plate Rolling Mill, Shovel Shop, Water Privilege, Land and Tenements situated at East Taunton, Mass. For further particulars, address

O. A. WASHBURN, Jr., Treas.,

Providence, R. I.

For Sale or To Lease,

at Perth Amboy, New Jersey, adjoining wharves of the Lehigh Valley R. R., 150 feet of water, admitting largest ocean steamships without obstruction of any kind, 1200 feet dock front by 4000 feet in depth. This property is crossed by the Lehigh Valley Railroad, the Pennsylvania Railroad and the N. J. Central Railroad, and besides being one of the finest Harbors on the Coast, is also on the line of the Delaware and Raritan Canal Towing Line. Thirty feet of water in front of property, and the Railroad, Lehigh Valley, N. J. Central and Pennsylvania, all crossing the tract. See map on page 41. Address

WILLIAM T. MEREDITH,

No. 48 Wall St., New York.

FOR SALE AT A BARGAIN.

The Plant and Stock of an Implement Manufacturing Company, located in Northern Iowa; established five years. Manufactures popular and well known, durable Machinery at new and modern design. Substantial brick buildings; sufficient for large business; use unfailing water-power at minimum cost. Good railroad facilities. Thriving town and removed from labor strikes. Address

IOWA.

Office of The Iron Age, 66 and 68 Duane Street, N. Y.

Business Opportunity.

Partner wanted with \$20,000 to double present capacity. Established manufacturing business; special and staple goods; first-class reputation; running right and day, and business increasing. None but principals need correspond. References given and required.

"ALRAP,"

Office of The Iron Age, 66 and 68 Duane St., N. Y.

ATTENTION,

Capitalist - and - Foundryman.

An Incorporated Company offers for sale State Rights to manufacture, and sell a valuable Patent Boiler (for house-heating). Hundreds in successful operation, which can be referred to for full particulars.

Address Box 1006,

WORCESTER, MASS.

New England States reserved.

TO MANUFACTURERS SEEKING A LOCATION:

Look at Eastville, Ill.; two railroad lines to Chicago direct communication with all Western and North-eastern points by Chicago, Burlington and Quincy, and Chicago and North-western systems. Cheap coal; two short lines to coal fields, one to Streator, Ill., one to Springfield and La Salle. Address

Cor. Secretary of Eastville Industrial Association, Eastville, Ill.

Special Notices.

BUSINESS OPPORTUNITIES.

MUNCIE, INDIANA,

is surely blessed by nature, and destined to become one of the great manufacturing cities of the West. It is already acknowledged by experts to be equal, if not superior, to Findlay, Ohio, as a natural gas-field. Its shipping facilities are unsurpassed for local and through rates East, West, North and South. It has all the modern improvements of the largest cities—Water and Gas Works, Edison Incandescent and Brush Electric Lights. Its healthy and beautiful location makes it a desirable home. Warren, Jones & Gratz have removed their immense Bagging Factory from Brooklyn, N. Y., to Muncie, and several other manufacturers in Glass, Iron and Wood are negotiating with the Board of Trade and private citizens for the same purpose. Its inhabitants are energetic, and famous for their liberality and social ability, and will cordially welcome all industrious people who will join them in their progressive march. All information desired can be had by addressing

SECRETARY BOARD OF TRADE,
MUNCIE, IND.

FOR SALE,

The Property known as "The Clark Mfg. Co.," Buffalo, N. Y., being 135 feet on Niagara Street, running through to Seventh Street 24 feet, three story brick building with basement, 60 x 100 feet; Brick Foundry, 25 x 135 feet; Large McKenzie Cupola and Blower; also Small Cupola and Blower; three Brass Melting Furnaces; one Harris Corliss Engine, 50 H. P.; one Babcock & Wilcox Safety Boiler, 75 H. P.; one Platform Fairbanks Scales; Lane, Shafting, and Pulleys; all in complete order. Address

JAMES E. FORD, Assignee,
Buffalo, N. Y.

Tack Factory For Sale.

The Tack Factory situated in Taunton, Mass., lately occupied by Lewis A. Rounds, deceased, under the name of the Sparta Tack Co. The mill is thoroughly fitted to carry on the business in all departments with a leasehold of the building. Among the machinery are twenty-nine keel and Blanchard machines, fifteen wire nail and tack machines, long emery grinder, sets of grindstones, bluing and pickling apparatus, &c., &c. Everything is in first-class order for carrying on the business, with good line of trade established. Will be sold low for cash. For further particulars inquire of

ALMEDA P. ROUNDS, ADMX. OF
H. J. FULLER, ATTORNEY.FOR RENT,
VALLEY FORGE MILL
AND WATER-POWER.

(Belonging to Estate of Charles H. Rogers, deceased.) Situated at Valley Forge, Pa., on the Philadelphia and Reading Railroad, 25 miles from Philadelphia. The buildings consist of a four-story stone mill, L shaped, with tin roof, 28 stone Tenant Houses and stone Dry and Dye House. The water-power is one of the best in the State. The property was occupied for many years as a Woolen and Cotton Manufactory, but is adapted to general manufacturing purposes. For particulars, address

J. B. CARTER, Hardware Manfr. Agt.,

504 Commerce St., Philadelphia.

A Good Clean Hardware Stock
For Sale

In a town of four thousand inhabitants in Southern Indiana; annual sales, \$35,000. This is a rare chance and will bear investigation. Cause of selling, death in family. Address

"LOCK BOX 13,"

Mitchell, Dak.

FOR SALE,

A stock of Hardware, Stoves and Implements of \$5000 to \$6000 in a county seat in Southern Indiana. The oldest and best known house in the county; the only house in the town with shop in connection; town of about 1200 inhabitants, and only one other hardware establishment; satisfactory reasons for selling. Address

"BOX 17,"

Bloomfield, Ind.

A Serviceable Facing

must neither burn nor run before the molten metal; it must adhere to the mold and "peel" from the castings. Pure Plumbago Facings for light work and for heavy work made by the

JOS. DIXON CRUCIBLE CO.,

Jersey City, N. J.

WANTED.

Manufacturers' Agencies.

Address J. D. ANDERSON, JR.,
P. O. Box 15, Montreal, Canada.

ADDITIONAL CAPITAL

WANTED.

A party with \$25,000 or \$35,000 capital to take an active interest in a well-known Agricultural Implement business in one of the largest and most prosperous cities in Tennessee. Full and thorough investigation is requested. References given and required. Address

"BOX K,"

Chattanooga, Tenn.

MANAGER for a well-equipped Machine Shop

and Foundry, incorporated under the laws of the State of New York, who can invest ten or fifteen thousand dollars with services and influence trade; a splendid chance for the right man. Address

"CONFIDENTIAL,"

Office of The Iron Age, 66 and 68 Duane St., New York

\$10,000.

A rare chance for an active party to purchase the receipts, moulds, &c. (with privilege of using present owner's name on metal) of one of the oldest established Babbitt Metal Makers in Philadelphia. Place will be rented to purchaser if desired; owner wishes to retire from active business. Following are the well-known brands: O. Genuine, No. 1, No. 2, 2 1/2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100. Address

JOSEPH W. BAKER,

821 North Second St., Philadelphia, Pa.

PARTNER WANTED—An honorable business man

or machinery iron works owners with simple means to properly handle an established first class and well-known special machinery business, covered by many Patents, to join experienced practical man and owner. Profits good and legitimate. Sales, one-quarter million per year and upwards. Customers reliable people. Best references required and given. Young man preferred. Address with full particulars

C. D., Box 97,

Office of The Iron Age, 66 and 68 Duane Street, N. Y.

HARDWARE BUSINESS.

Wanted, a partner to assist in buying out an old and well-established Hardware Store, doing a business of about \$100,000. Situated in one of the largest and most flourishing cities in New England. Address

Office of The Iron Age, 66-68 Duane St., New York.

Special Notices.

BUSINESS OPPORTUNITIES.

PUBLIC SALE

Valuable Engine and Machine Shops and Foundry at Columbia, S. C.

For the purpose of settling the affairs of the late firm of Tezer & Dial, both partners having died, the undersigned will sell under the orders of Court to the highest bidder on Monday, the 4th day of June, 1887, in Columbia, S. C., the very valuable Engine and Machine Shops and Foundry known as the Tezer & Dial Engine Works. These shops are fitted with all of the most improved Machinery, Tools, Shafting, &c., propelled by a 25 horse-power and a horse power engine. The buildings are new, of brick with tin roofs, and cover more than an acre of ground. A railroad track runs into the grounds connecting with all of the railroads running into the city. This establishment is one of the most complete and well-appointed plants in the Southern States and has commanded a very wide, extended and profitable patronage. Terms, one-third cash, balance in two equal annual installments.

For further particulars, apply to the undersigned, Columbia, S. C., JOHN T. SKIBELS,
12th May, '87. Master for Richmond Co., S. C.

A NOTICE

appeared in The Iron Age of April 21, 1887, under the head of an A. No. 1 Opportunity for some enterprising town and signed by J. H. Gilbert, President of The Gilbert Lock Co. This Notice was not authorized by The Directors of The Gilbert Lock Co., and was published without their knowledge, and is not recognized by them.

J. K. OSBORN, President,
Gilbert Lock Co.,
Newark, N. J.

METALLURGICAL ENGINEERING.

I am prepared to furnish
PLANS, SPECIFICATIONS and
ESTIMATES
AND TO
SUPERINTEND THE CONSTRUCTION OF ROLLING MILLS and MACHINERY, REGENERATIVE GAS FURNACES,
TUBE and PIPE MILLS,
ETC., ETC.

I represent the latest improvements in all the above branches.

M. V. SMITH, Metallurgical Engineer,
Rooms 16, 17, and 18 Bissell Block, Pittsburgh, Pa.

The Techno-Chemical Receipt Book.
NOW READY.

Containing Several Thousand Receipts, covering the Latest, Most Important and Most Useful Discoveries in Chemical Technology, and the Practical Application in the Arts and Industries. Edited from the German of Dr. Winkler, Kaiser, Helmholtz, Merzins, Jacobsen, Kollet and Heinzelner, with additions by William T. Brandt, graduate of the Royal Agricultural College of Elders, Prussia, and William H. Wahl, Ph. D. (Field), secretary of the Franklin Institute, Philadelphia author of "Galvanic Plastic Manipulations." Illustrated by 78 engravings in one volume, over 500 pages, 12 mo., closely printed, containing an immense amount and a great variety of matter. Elegantly bound in scarlet cloth, gilt Price \$2. free of postage to any address in the U. S.

Illustrated by 78 engravings in one volume, over 500 pages, 12 mo., closely printed, containing an immense amount and a great variety of matter. Elegantly bound in scarlet cloth, gilt Price \$2. free of postage to any address in the U. S.

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Illustrated by 78 engravings in one volume, over

Special Notices.

MACHINERY
BARGAINS IN
MACHINERY.

12 in. Double Table Shaping Machine,
400-lb. Merrill Drop Hammer,
Planer, 24 x 4,
Engine Lathe, 40 in. x 16 ft.,
25-in. B. G. S. F. Upright Drill,
28 in. " " "
36-in. " " "
20-in. Upright Drill, B. G.,
Pittsburg Planer, 24 in. x ft.,
Engine Lathe, 22 in. x 12 ft.,
Engine Lathe, 15 in. x 6 ft. #4. G. Screw-Cutting,
Durrell Seven-Spindle Nut Tapper,
Speed Lathe, 16 x 6 ft.,
Engine Lathe, 16 x 6 ft. Power cross-feed,
Engine Lathe, 48 x 8 ft. Power and compound
rest,
Small Radial Drill,
Cold-Rolled Shifting, Hangers, Pulleys, &c.

FRASER & ARCHER,
121 Chambers St., New York.

Second-Hand Machinery.

20 x 20 x 4 Lathe & Morse Planer.	Good order.
22 x 32 x 4 Thayer & Houghton Planer.	Do do
28 x 28 x 7	Do do
28 x 28 x 5½ Cove	Do do
40 x 30 x 8 Steepie	Do do
25 x 20 x 8 Pond	Do do
130 x 30 x 9 Niles	Do do
31 19 in. x 8 ft. L. B. & Co. Eng. Lathe.	Do do
2 21 x 8 Piffitt	Do do
1 18 in. x 8 Jones & Lamson	Do do
1 27 in. x 12 New Haven	Do do
1 Gould Gen Cutter	Do do
1 Frumson 5	Do do
2 Days Key Staters. Large.	New.
2 " " Small.	Do do
2 Water Grinders. Diamond	Do do
1 Large Horizontal Pool 10 ft. Hoisting. 60 in.	Do do
wing, 12 ft. bed, weight 10,000 lbs.	Do do

LORGE DAVIS & CO. Cincinnati, Ohio.

FOR SALE,

One standard gauge Locomotive, weight about 10 tons, cylinders 7 x 16 in., 4 drivers 36 in. dia., front trucks 22 in. dia., tender on 4 wheels 24 in. dia., tender will hold water for 25 miles run and coal for

600 miles. Eight Flat Cars on 4 wheels each 26 in. dia., with heavy axles. The whole outfit is in good, fair shape and will be sold cheap, as the owner has no further use for it. Address W. M. FITZSIMONS, 626 Broadway, Cleveland, Ohio.

WANTED,

a Vertical or Guillotine Shears, either new or second-hand, that will cut 60 in. x $\frac{3}{4}$ in. thick. Address

" W. C."

P. O. Box 33, N. Y. City.

Engines For Sale.

One Horizontal Corliss Engine, 34 x 60.

16	16	16	16	12 1/2 x 24.
16	16	16	16	20 x 42.
16	16	16	16	18 x 42.

Send for Revised List.

D. B. CRUICKSHANK,
243 Dyer St., Providence, R. I.

GAY'S DUPLICATOR

Mail Forwarding Book

PRICE, 35 CENTS.

Mail Forwarding Orders, PLAINLY AND ACCURATELY MADE OUT, should always be left with hotel keepers.

entrusted the duty of forwarding your mail. **PAY** **ATTENTION** to this will be of great advantage. This blank order (properly filled out, being exact size of postal card) is of convenient size for keeping in letter box, under your pillow at hotel or post office, and will there **MORE READILY** catch the eyes of party forwarding mail.

It may be found convenient for using as a "time card" or "pottle sheet," for use of your "house."

The "Stub," filled out, will be convenient for future reference, and can be used as evidence in case of error in forwarding mail, etc.

Sent, *post paid*, on receipt of the price by

DAVID WILLIAMS, 66 and 68 Duane St., New York

NOTICE.

We buy and sell all classes of Iron and Steel Scrap. Correspondence solicited.
JOS. C. POULTERER & CO.,

216 S. Fourth St., Philadelphia

WANTED.

IRON AND

STEEL SCRAP.

Address **VALENTINE & ARMSTRONG,**
226 S. Fourth st., Philadelphia, Pa.

IMPORTANT.

Wanted Cast Wrought Iron and Steel Turnings.
Address, **THOMPSON C. GILL & CO.,**

Dealer in Iron and Steel of all kinds,
210 South 3d Street, Philadelphia, Pa

GROOVED SKELP IRON

UP TO 30 INCHES WIDE.

Patents for rolling the above just granted to
W. G. ROWELL,
17th and Clearfield Streets, Philadelphia.
Correspondence Solicited.

WANTED,
Iron and Steel Scrap.

We buy all kinds of Iron and Steel Scrap
Write to us when you have any to sell.
SITES, WHEELER & CO.,
232 and 234 So. Third Street,
Philadelphia, Pa.

Trade Report.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, May 18, 1887.

Scotch Pig.—The market is a little steadier. Warrants close at 41/7, against 41/ last week. Makers' brands are quoted as under:

Coltness, alongside, Glasgow.	54/
Langloan.	50/6
Glenarnock.	47/
Gartsherrie.	47/
Shotts.	48/6
Dalmellington.	43/6
Carnbroe.	43/6
Eglington.	42/6
Summerlee.	52/
Carriage from Ardrossan to Glasgow is 1/10 ton.	

Bessemer Pig.—The market is unchanged. We quote W. C. Hematites, Nos. 1, 2 and 3, 43/ @ 45/.

Cleveland Pig.—The market is a little steadier at unchanged prices, viz.: 37/ for No. 1 Foundry; 36/ for No. 2; 34/ @ 34/10 for No. 3, and 33/ for No. 4 Forge.

Bessemer Billets.—Bessemer Billets, 2 1/2 x 2 1/2 inches, are £3. 15/ @ £3. 17/6.

Bessemer Blooms.—The market is still irregular. We quote: Blooms, 7 x 7 inches, £3. 12/6 @ £3. 15/.

Bessemer Crop Ends.—We quote run of mill 50/ @ 52/.

Manufactured Iron.—The market is irregular. We quote:

Staff. Ord. Marked Bars.	6 10 0 @	5 15 0
Medium.	5 5 0 @	5 15 0
Common.	4 15 0 @	5 5 0
Hoops, 20 W. G. and over.	6 0 0 @	6 10 0
Common Best.	5 10 0 @	6 0 0
Medium.	5 0 0 @	5 2 6
Common.	5 0 0 @	5 2 6
Sheets, 20 W. G. and under.	6 15 0 @	7 5 0
Ordinary Best.	6 0 0 @	6 5 0
Common.	6 0 0 @	6 5 0

Welsh Bars are quoted £4. 2/6 @ £4. 5/.

Steel Rails.—The market is unchanged, with prices at £4 @ £4. 5/.

Old Rails.—The market is irregular, with closing quotations for Tees and Double-Heads, c.i.f. New York, 60/ @ 65/.

Scrap.—With an irregular market, quotations are at the close 55/ c.i.f. New York for Heavy Wrought Scrap.

Copper.—The market is unchanged, Chili Bars closing £39. 5/ @ £39. 10/, and Best Selected, £44. 5/ @ £44. 10/.

Tin.—The market is a little steadier, spot closing £104. @ £104. 10/, and futures £104. 10/ @ £105.

Tin Plates.—The market is a little firmer. We quote:

Tin Plates, 10x14, 1st qual. Charcoal.	17/ @ 18/
" " " " " "	15/ @ 15/6
" " " " " "	13/6 @ 14/6
" " " " " "	13/6 @ 13/6

Spelter.—The market is unchanged. We quote £14. 2/6.

Lead.—We quote £12. 10/ @ £12. 12/6 for Common English Pig.

Freights.—Steam freights from Glasgow to New York are 7/6. Tendency upward from Glasgow and Liverpool to New York; from Liverpool to Philadelphia irregular.

Financial.

Office of The Iron Age,
WEDNESDAY EVENING, May 18, 1887.

In trade and finance there are no marked changes, but underlying the surface there are subtle influences which are unusual, and may prove potential for good or ill. Their present effect is to introduce elements of uncertainty unfavorable to legitimate business. One of our mercantile authorities speaks of a silent "revolution" in progress, attributable to a variety of causes, such as the Interstate Act, an expansion of currency, and a rage for speculation, which pervades a large portion of the South and West. One effect of the new law is to stimulate traffic in numerous well defined localities while others are correspondingly depressed. Certain special interests, too, notably, the river business of the West, not less than traffic over the lakes, is in augmented volume. Railroads are also counting up large receipts, notwithstanding an important diversion of freight by water routes—by lake, canal, and "around the Horn"—affording opportunities for American shipping beyond the experience of many years. The Canadian Pacific Railway, besides securing transportation for California wool, has contracted to take eastward across the continent no less than 10,000,000 lb of sugar, although it is intimated that hereafter the Hawaiian sugar crop is likely to take the sea route from Honolulu to New York direct in its crude state. In New York, freight agents report that merchants are still holding back certain lines of goods in the hope that a reclassification can be obtained from the principal railroad companies. In the meantime, the trunk lines are unable to promise any important modifications.

The Stock Exchange markets reflected the more cheerful tone lately noticed and was more active, at prices somewhat improved. A check was imposed by apprehensions of dearer money, but the coal shares gained strength on the assurance that there would be no strike in the mining regions, and on Thursday there was a general advance. Many railroads report encouraging gains.

On Friday the bull movement made further progress, and Judge Cooley's letter to Secretary Bayard was referred to as tending to reassure those who feared evil from the Interstate law. Saturday's bank statement had no appreciable effect. Crop reports were favorable. To-day stocks opened higher, but receded, and are pretty strong; coal stocks heavy.

United States bonds closed as follows:

U. S. 38.	100 @	110 1/2
U. S. 4 1/2, 1891, coupon.	100 @	110 1/2
U. S. 4 1/2, 1897, coupon.	100 @	120 1/2
U. S. Currency 68, 1895.	100 @	120 1/2
U. S. Currency 68, 1896.	100 @	120 1/2
U. S. Currency 68, 1897.	100 @	134 1/2
U. S. Currency 68, 1898.	100 @	134 1/2
U. S. Currency 68, 1899.	100 @	137

The total bank clearings last week in 36 cities showed an increase compared with last year of 23.6 %; outside of New York, 22.8 %; Compared with the previous week, this exhibit is unfavorable, mainly on account of the numerous heavy transactions taking place about May 1.

Accounts respecting general trade are hardly as encouraging, but the outlook as a whole is relieved by the large export movement of wheat, which serves to help the balance of trade. Dry goods jobbers, after six weeks' experience, find their business restricted by freight problems, but the retail demand has taken a fresh start. Speculation in wheat and coffee have been leading features. While the former is sustained by shrinking visible supplies and advices from Europe, the latter shows signs of weakness. Reports from the West and Southwest show a larger and more active distribution of merchandise and commodities than a short time ago. By way of Paris word comes that a Chicago house has contracted with the French Government for 4,500,000 kg. of canned meats. This is stated to be the largest contract ever made with an American firm by a foreign Government. In Chicago the strike in the building trades threatens serious damage to local interests. The Connellsville coke strike effects the entire region West of the Alleghenies. Trouble in the Anthracite mines is happily averted.

The bank statement showed a further loss of \$361,150 in surplus reserve, bringing that item down to \$4,161,450, in comparison with \$12,497,075 this time last year. A gain of \$1,104,300 in legal tenders supports the theory that last week's heavy decline in reserve was largely due to their temporary withdrawal for the purpose of avoiding taxation. It is also observed that currency does not return as rapidly from the interior as it did in former years, on account of the greater use for money in connection with the construction of new railroads and the activity in other branches of industry, to say nothing of the speculation in real estate and wheat. As bearing directly upon the financial outlook for the next few months, Henry Clews & Co. say "certain important 'deals' affecting large corporate interests may be expected to culminate within the next 30 or 40 days. Among these may be enumerated:

1. The completion of the negotiations for the transfer of a controlling interest in the Baltimore and Ohio, with resulting combinations to form a new system of roads, and a possible settlement of telegraph competition. 2. The virtual consummation of the reconstruction of Reading, which, by its new alliances and its improved management, is becoming one of the most important properties among our railroads. 3. The financial reconstruction of Central of New Jersey, and the consummation of arrangements which will add largely to its resources as a terminal road. 4. The extension of the Manhattan consolidated system, with possible connections with Eastern lines; and 5. The settlement of the embarrasments which have so long depressed the Wabash system. The operations attending these changes in important properties, occurring almost simultaneously, will cover a very large aggregate of securities, and can hardly fail to be a factor of great influence in the summer months." According to the Custom House report the total exports of specie from this port during the week were \$307,721; total imports, \$132,740; total exports since January 1, \$9,298,126; total imports, \$5,035,180.

The Saturday Half Holiday law promises to be a nullity, excepting as it will affect the presentation for payment or acceptance of commercial paper. The associated banks of this city, by their action in the Clearing-House, decided to continue their business on Saturday until 3 o'clock, regardless of the intent of the law, "there appearing to be nothing in the legal requirements of the act that conflicts with the rules and regulations of the New York Clearing-House Association." The down-town exchanges hesitate respecting the course to be pursued, but will probably accept the views as formulated in the resolutions of the bank managers.

The imports of merchandise at this port during the week were \$7,775,572, including \$1,695,000 in dry goods, making a total, since January 1, of \$173,308,465, against \$162,256,000 for the same time last year, and \$146,540,000 in 1885. The exports are \$227,000 above those of the previous week, the total valuation being \$5,745,155, making \$110,883,362 since January 1, against \$113,912,000 for the same time last year, and \$125,978,000 in 1885. The items include 89,773 barrels of wheat flour, 1,091,412 bushels of wheat, 195,918 bushels of corn, 8014 bales of cotton, 6,203,326 gallons of petroleum, 3,796,182 lb of cut meats and 3,763,518 lb lard.

NEW YORK.

American Pig.—Reports from the leading consumers throughout New England indicate that the founders of that section are still well supplied with raw material, the majority having iron due to them in sufficient quantity to last them up to July. The local market is very dull so far as new current business is concerned, but, in spite of the long period of inactivity, remains steady, very little iron pressing on the market. Sales of Southern Iron reported in other quarters turn out to be off grades, chiefly for pipe founding. We continue to quote for moderate lots, \$20.50 @ \$21.50 for No. 1 Foundry, \$19.50 @ \$20.50 for No. 2 Foundry, and \$18 @ \$18.50 for Gray Forge.

Scotch Pig.—The demand is very limited, but on the other hand imports are very small. We quote for round lots, to arrive: Coltness, \$21.50 @ \$21.75; Glenarnock, \$20 @ \$20.50; Shotts, \$21 @ \$21.50; Gartsherrie, \$20.50 @ \$21; Carnbroe, \$20.75 @ \$21.25; Clyde, \$20 @ \$20.50; Summerlee, \$21.25 @ \$21.50; Dalmellington, \$20 @ \$20.10, and Eglington, \$19.50 @ \$20.

Bessemer Pig.—Contrary to our expectations no inquiries whatever have thus far been in the market for Foreign Bessemer as the outcome of the Coke strike. In any case it would be difficult to supply prompt delivery, on account of high rates of freight. There has been considerable business in Domestic Bessemer Pig, one sale being reported of about 8000 to 10,000 tons from a furnace in Central Pennsylvania, using foreign ores, terms being private.

Spiegeleisen.—The only transactions have been those brought up by the closing down of a Western Spiegeleisen manufacturer picking up in this market about 1200 to 1500 tons of 20% Spiegeleisen, and about 1000 tons of 80% Ferro, all at private terms. We quote nominally for later delivery 20% Foreign, \$27 @ \$27.50, and 80% \$59 @ \$60.

Bar Iron.—There has been a slight increase in the demand for moderate-sized lots, and a number of consumers are making inquiries to cover early requirements. We continue to quote: Common, 1.85¢ @ 2¢; Medium, 2¢ @ 2.10¢, and Refined, 2.10¢ @ 2.50¢ on dock.

Structural Iron.—No business of any magnitude has been done during the current week, still the mills are well supplied with orders and remain firm. We quote Angles, 2.35¢ @ 2.40¢; Tees, 2.70¢ @ 2.90¢, and Channels and Beams, 3.30¢ base, on dock.

Plates.—We quote for round lots of Common or Tank, 2.30¢ @ 2.50¢; Refined, 2.50¢ @ 2.60¢; Shell, 2.7¢ @ 2.8¢; and Flange, 3.7¢ @ 3.8¢; Extra Flange, 4.25¢ @ 4.50¢. For Steel Plates quotations are as follows: Tank, 2.75¢ @ 3¢; Ship, 3¢; Shell, 3.10¢ @ 3.25¢; Flange, 3.25¢ @ 3.65¢, and Fire-Box, 4.20¢ @ 4.50¢, on dock. Foreign Sheets are offered at 2.25¢. In Domestic some large contracts for delivery over a period of months have been placed.

Steel Rails.—Among the sales during the past 10 days we note 3000 tons to the New York, New Haven and Hartford, 5000 tons to Detroit, Lansing and Northern, 5000 tons as a part of a block taken back by an Eastern steel mill, and 6000 tons to the Northern Pacific not previously reported. In addition thereto we note a sale of 3000 tons at East St. Louis under \$13. There are a number of inquiries in the market for standard sections from Ohio, Illinois, the Northwest and Southwest, the total showing a heavy aggregate. There is also considerable inquiry in small lots for light and street rails, both for the South and for New York and New England. One of the largest inquiries for street rails received for some time past is a lot of 1200 tons. There are negotiations now going on for a very large block of foreign rails for a Southwestern road. Freight from abroad at the present time are high, so that they cannot be laid down as cheaply as low quotations from England would indicate. The last report of the Board of Control, just issued, shows that sales for delivery during 1887 thus far made aggregate 1,598,048 tons out of a total allotment of 1,761,139 tons. We continue to quote \$38 @ \$39 for standard sections at Eastern mill.

Blooms and Billets.—The market is very dull, foreign Blooms remaining nominally \$29 @ \$29.50.

Wire Rods.—The market is very flat, with no business reported during the week. We quote for shipment, \$40 @ \$40.50. Some of the Joliet mills have closed down on account of the strikes, and this has a tendency to lessen the demand.

Scrap.—The market is very dull, with Foreign offered at \$20 @ \$20.50; Yard Scrap at \$22 @ \$22.50, with the majority of holders asking \$23.

Rail Fastenings.—We quote Spikes 2.40¢ @ 2.50¢ here; Angle Fish Bars 2.15¢ @ 2.25¢, and Bolts and Nuts 3.10¢ @ 3.20¢, and Bolts and Hexagon Nuts 3.25¢ @ 3.30¢.

Old Rails.—The only transaction during the week has been a sale of 100 tons of foreign Tees, at \$21 on cars, Jersey City. During the week, 2000 tons of Rails from India have been stored, and in addition thereto a 1000 ton lot has been stored. Double heads have been offered during the week at \$21.75 in port, and Tees are offered

for shipment at \$21.50, and have no buyers. On the other hand, the majority of holders are out of the market at present prices.

Imports of Iron, Steel and Metals Into New York.

	To May 7.	Last week.
	Gross tons.	Gross tons.
Iron Ore.	7,570	902
Pig Iron.	36,439	4,597
Spiegeleisen.	31,030	2,000
Old Rails.	69,613	4,224
Scrap Steel.	9,740	852
Scrap Iron.	7,315	1,419
Blooms and Billets.	27,339	1,224
Steel Rails.	126	126
Wire Rods.	35,399	2,130
Iron Bars.	3,575	85
Steel Bars.	4,633	809
Beams.	662	95
Steel Plates.	3,198	467
Pig Tin.	4,132	10
Tin Plates, boxes.	589,505	46,125

Philadelphia.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, May 17, 1887.

Pig Iron.—The market seems to be a shade better, although still very dull. There is more inquiry, however, and there have been some good sized lots taken, and in a general way there is a better feeling all the way through. The leading furnaces have been able to keep clear of accumulations so far, and with prospects of a somewhat more active demand there is a disposition to hold prices steady at about to-day's quotations. There is not a great deal of iron for sale, and anything like a moderately active demand would make it seem scarce, but under present conditions buyers get the impression that there is an increasing surplus, so that they are unwilling to take more than needed for present requirements. This is largely due to the fact that there are several new brands offering, and as consumers are averse to trying experiments, it requires a great amount of pressure to get any one to take hold. Besides this the old companies do not like to see their trade broken into, and in some cases have made low quotations in order to meet this class of competition. Apart from this the market has a fairly steady appearance, and it is thought that bottom figures have been reached—for awhile, at all events. The enormous output, and the preparations for its further development, place a pretty strong barrier against any advance in prices, although the scarcity of ores or fuel may have an influence in that direction. In the meantime there is a disposition toward conservatism on both sides, and, as already stated, no material change in prices is looked for until the indications become more definite than they are at present. Sales during the week have been on the basis of \$20.75 @ \$21.25 for No. 1 Foundry, at tide, \$19.50 @ \$20 for No. 2, and \$18 @ \$18.50 for Gray Forge. Special brands command 50¢ to \$1 more money, while new brands, and those a little off in quality, are as much lower. In 1000 and 2000-ton lots of No. 2 iron, one or two sales have been made at specially low figures, but the general market is about as above quoted.

Foreign Iron.—There is nothing doing, and prices are purely nominal as quoted a week ago—viz.: \$20.50 @ \$20.75, c.i.f. duty paid, and 20% Spiegel, at \$27.50 @ \$28.

Blooms.—Nothing doing in Steel Blooms, which are nominally worth about as follows: Rail Blooms, \$29 @ \$30 asked for shipments; Nail Slabs, \$30 @ \$31; Sheet-Iron Billets, \$34 @ \$36; Anthracite Blooms and Ore Blooms have been rather more active, with sales at about last week's prices, say: Charcoal Blooms, \$54 @ \$55; Runout Anthracite, \$47 @ \$48; Scrap Blooms, \$38 @ \$39 "bloom" ton.

Muck Bars.—Demand rather slow and prices easier; sales chiefly at \$32.50 at mill. Some ask \$33, while in other cases \$32 is mentioned as being quoted for 500-ton lots, but a good deal depends on the delivery.

Bar Iron.—As compared with last week and the week before, there is probably some little improvement in the demand, but at best business is not what it ought to be. Prospects are a trifle better, however, and it is expected that a good deal of business will be placed before the end of the month, not enough to cause improvement in prices, but enough probably to prevent further decline. Some of the mills are running tolerably full at about 2¢, but there are others that find it hard to fill up at 2¢, and for large orders buyers look for concessions even at that figure. The difficulty in the way of improvement is that the mills are nearly all anxious for business, which creates so much competition that it is almost useless to ask over 2¢. Skelp Iron is beginning to look up again, however, and with anything like the demand that was experienced during last winter prices ought to improve. It is understood that a great deal of business will be on the market at an early date, but, in the meantime, there are free sellers of Grooved Skelp at 2.15¢, and Sheared at 2.3¢.

At the usual monthly meeting of the Bar-Iron manufacturers, held here yesterday, it was resolved to maintain the card rate at 2.2¢ as the basis of labor for the coming month.

Plate and Tank Iron.—Some improvement in the demand is reported, but there are still a good many mills that are anxiously looking for buyers. Prospects are said to be improving, and it is not unlikely that a good deal of business will be placed this month, but it is doubtful if prices will be any better. Quotations are nominally the same as last week, but there are some who are willing to make concessions, providing the order is large enough to make it desirable. We

quote about as follows: Ordinary Plate, 2.25¢ @ 2.3¢; Tank, 2.3¢ @ 2.35¢; Shell, 2.5¢ @ 2.6¢; Flange, 3.5¢; Fire-Box 4¢; Steel Plates, Tank, 2.8¢; Shell, 3¢; Flange, 3 1/4¢; Fire-Box, 3 1/4¢ @ 4¢.

Structural Iron.—There is a great deal of business in sight, but the amount actually closed is not specially important, although it about equals the week's output. The mills are well supplied with orders, however, and the feeling is one of confidence, as there is every reason to expect a continued good demand during the summer months. Prices are steady, and for bridge specifications quotations are about 2.4¢ @ 2.5¢ for Bridge Plate; 2.30¢ @ 2.35¢ for Angles; 2.8¢ @ 2.9¢ for Tees, and 3.3¢ for Beams and Channels.

Sheet Iron.—Demand very slow, but prices are steadily held at about the following quotations:

Best Refined, Nos. 26, 27 and 28.	34¢
Best Refined, Nos. 18 to 25.	34¢
Common, 4¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28.	44¢ @ 45¢
Best Bloom Sheets, Nos. 22 to 25.	44¢ @ 45¢
Best Bloom Sheets, Nos. 16 to 21.	34¢ @ 35¢
Blue Annealed.	2.8¢ @ 3¢
Best Bloom, Galvanized, discount.	60¢
Common, discount.	65¢

Steel Rails.—There is a fair demand for Rails, and prices are steadily maintained at about \$39 @ \$40 at mill. The lots called for are chiefly in 500 to 1000 ton lots, for which \$39 is bid; but \$40 is usually asked, with sales at from \$39.50 to \$40. There is plenty of work on hand, however, and no fears are entertained as to the outcome of the year's business. Somewhat lower figures are mentioned at mills further North, but nothing less than \$39 has been accepted in this market.

Old Rails.—The market shows no animation, and such sales as have been made were at low prices, say about \$21.50 @ \$21.75 for lots of T's, ex-ship. Store lots are held at \$23 @ \$24, but the offerings afloat are still in excess of the demand, and the outlook is far from encouraging to holders.

Scrap Iron.—Market dull and heavy, with free offerings at quoted rates, which are about as follows: Cargoes of No. 1 Scrap, \$20.50 @ \$21.50; small lots, tidewater delivery, \$22.50; Selected do., \$23 @ \$24; No. 2 do., \$16 @ \$17; Turnings, \$15 @ \$16; Old Car-Wheels, \$17.50 @ \$18.50; Old Steel Rails, \$23 @ \$24; Cast Scrap, \$16 @ \$17; do. Borings, \$12 @ \$13; Old Fish Plates, \$26 @ \$27 asked.

Wrought-Iron Pipe.—Demand continues fair, and prices are somewhat easier. Jobbers are cutting to some extent, which has the effect of softening manufacturers' prices. Discounts remain as last quoted—viz.: Lap-Welded Black, 50 %; Lap-Welded Galvanized, 32 1/2 %; Butt-Welded Black, 32 1/2 %; Butt-Welded Galvanized, 22 1/2 %; Boiler Tubes, 42 1/2 %.

Nails.—No improvement is noticeable, the market being dull and weak. Price is quoted at \$2.35 from store for standard brands. Other Nails of lower grade are selling as low as \$2.05 @ \$2.10 for carload lots.

Pittsburgh.

Office of The Iron Age, 77 Fourth avenue, PITTSBURGH, P.A., May 17, 1887.

The immediate future of the general Iron business in this locality hinges to a considerable extent upon the strike of the coke-workers. If it holds out a week or two longer Pig Iron will possibly advance, while, on the other hand, if it should collapse suddenly, the effect would be of an opposite character. In regard to the strike in question, there is nothing new to note; the situation remains unchanged. There is still considerable inquiry for both Iron and Steel in Pittsburgh, notwithstanding unfavorable reports. The construction of a new cable street railway will require 1000 tons of Steel. Bids for this work are now being solicited, and it is expected that the contract will be awarded within a few days. In addition to this there will be some other large contracts on the market before long. It is worthy of mention that several large lots of the "Marshall" Iron, after being held by the banks and insurance companies, by whom it was taken from Marshall as collateral a number of years ago, were sold during the week under review, and for considerably less money than could have been obtained for it a couple of months ago. The holders aforesaid refused to sell on a rising market, a very common mistake, and the break coming sooner than expected, they were caught, as were some others. A good deal of this "Marshall" Iron is passing into the hands of consumers, and furnacemen are hopeful that it will soon be a thing of the past, as it has been an eyesore to them ever since it was thrown upon the market.

Pig Iron.—There was more business reported the past week than for some weeks preceding, but the market continues in an irregular and unsettled condition. Some consumers are buying all the cheap lots that are being offered, while others are buying only as their immediate necessities require. Already the strike has curtailed production, and if it holds out a month or more, the effect will be a good deal more apparent. Prices continue weak, the best brands are off \$1 per ton as compared with the highest point, while unknown or mixed lots have been sold at a decline of about \$2. Included

Trade Report.

with sales reported during the week were some 3000 tons of "Marshall" Gray Forge, at \$18, four months; standard city brands of same, at \$19, cash; Bessemer Iron, it is claimed, has been sold at furnaces, west of here, at equal to \$20.50 @ \$21, cash, delivered in Pittsburgh. It is rumored that there is an effort being made to bear the market for Bessemer, but whether there is anything in the rumor we are not prepared at present to state; certain it is, however, that some large operators are very bearish in their views at present, who not a great while ago entertained views very different. In the present condition of the market it is difficult to give accurate quotations, as prices are very irregular:

No. 1 Gray Forge.....	\$19.00 @ \$19.50, 4 mos
No. 2 Gray Forge.....	18.00 @ 18.50, 4 "
All Ore, Mill.....	30.00 @ 30.50, 4 "
No. 1 Foundry.....	21.50 @ 22.00, 4 "
No. 2 Foundry.....	20.00 @ 20.50, 4 "
Charcoal Foundry No. 1.....	25.00 @ 25.50, 4 "
Cold Blast Charcoal.....	28.00 @ 28.50, 4 "
Bessemer Iron.....	21.00 @ 21.50, 4 "

Muck Bar.—There has been rather more business the past week, but prices continue weak. We can report sales of some 1500 tons at \$32 @ \$32.50, cash. Now that the hot season is at hand, when there is nearly always an increased demand, the market appears to have steadied up, but some operators are inclined to the belief that it will go still lower.

Manufactured Iron.—There has been very little change in the situation during the past week; business continues light as compared with what it has been, but the mills as a rule are still pretty well employed, and the indications are that there will be an improved demand later on in the season. No doubt a good many buyers are holding off in expectation of lower prices, and it is not to be expected that they will place their orders as long as there is a possibility of a decline. Manufacturers are still quoting on a basis of 2¢ for Bars for good Irons. The demand for Skelp Iron is not as good as it was at this time last year, and the expectations of the more sanguine have not been realized.

Nails.—Continue very dull for the season of the year, and manufacturers can give no very satisfactory explanation in regard thereto. It has been very dull all spring, not only here but at Wheeling as well. Usually there is a good trade this month, but, as already intimated, it is almost as dull now as during mid-winter, when but little is expected. There is a good deal of building going on throughout the country, but builders do not appear to want nails. The regular monthly meeting of the Western Association took place here last Wednesday, but there was nothing done beyond regular routine business; the members almost without exception reported business as being very dull and unsatisfactory. No change was made in the card, \$2.25, 60 days, 2¢ off for cash, but it is said that sales are being made considerably below the card.

Billets, &c.—Everything in this line continues very dull, and with a sharp competition for business, prices are weak and irregular. We are advised of a sale of 1000 tons (American) Steel Billets at \$32 cash. Steel Nail Slabs continue very dull, and no improvement need be looked for while the Nail trade remains in its present depressed condition. Steel Wire Rods are quoted nominally at \$43.50 @ \$44.

Steel Rails.—There is some inquiry, but no sales have been reported recently. We continue to quote Heavy Sections at \$40, cash at mill. A broker is in negotiation for a lot of 10,000 tons of foreign, to be delivered at a Gulf port, and as there are only 50¢ between the principals it is probable the sale will be effected. The price demanded is understood to be \$41, while the buyer offers \$40.50. The price asked by American mills would make the cost at point of delivery a couple of dollars per ton more than they can be put there from England.

Old Rails.—While trade continues very dull, there has been no recent change in prices; we continue to quote at \$25 @ \$26 for Foreign, delivered in Pittsburgh. Consumers are still buying very sparingly. Some holders are refusing to sell at prices quoted, but will hold for a better market, which they are confident is near at hand. One of the strongest points advanced by them is that Rails can be laid down at the seaboard from across the water at present prices.

Wrought Iron Pipe.—There is a very fair advance for large Pipe, but the smaller sizes continue dull; it is expected, however, that there will be an improvement in the latter later on in the season. One firm here is said to have a contract for the making of 100 miles of natural Gas Pipe; no change in prices. Discounts on Black Butt-Welded Pipe, 35 %; on Galvanized do., 25 %; on Black Lap-Welded Pipe, 52 1/2 %; on Galvanized do., 35 %; Casing, all sizes, 45 %; Boiler Tubes, 45 % off; 2-inch Tubing, 16¢ per foot, net; 2-inch Line Pipe, 14¢; 8-inch Drive Pipe, \$1.40.

Chicago.

Office of The Iron Age, 36 and 38 Clark St., Cor. Lake St., Chicago, May 16, 1887.

The condition of local trade is more unsatisfactory than ever. Freight rates have now been adjusted, so that shippers know what they have to pay for transportation, but the elimination of that cause of trouble has been followed by another vexatious and perhaps serious interference with business

in the great struggle for supremacy now going on between the building-trade unionists and the master builders of the city. Work on all large undertakings has been suspended since the evening of the 13th, and nothing will be done toward completing them or starting new building operations until the difficulty is settled. Both sides are very firm. Such contracts for material as may be let now will of course be subject to the conditions which may prevail when deliveries come to be made. The Coke strike has thus far had no effect on the price of any kind of Iron in this market, except in stiffening the views of one or two holders of Bessemer Pig. If it continues for some time, however, and Coke Iron becomes scarce, prices will be affected all along the line. But before that time arrives it is likely that the differences between the operators and their employees will be adjusted.

Pig Iron.—The demand continues to run mainly to carload and 50 ton orders, but consumers' stocks are shown to be very low by their urgent demand for prompt shipment. Car-wheel makers are asking for rates on Charcoal Iron, with indications of heavy buying in June, if not earlier. The fear of a shortage of Coke Iron, in consequence of the strike in the Connellsville coke region, has drawn the attention of certain branches of trade to Charcoal Iron, but a very limited supply can be had from that source, as most furnace agents are anxious to serve their regular trade rather than to enjoy a temporary increase of business, with possible embarrassment in supplying their customers later in the year. The price of Bessemer Pig Iron has been slightly affected in some quarters, but former prices are being adhered to by those manufacturers who believe that the Coke strike will be of short duration. Offers of Open Bright and Silvery Southern Coke Iron at low prices are disturbing the market for Ohio Softeners, with which they compete. Regular grades of Southern Iron are not available in any quantity, but these off grades are evidently being pushed to avoid accumulation at furnaces. Quotations are as follows, for cash, f.o.b. Chicago: Lake Superior Charcoal, Nos. 1, 2 and 3, \$23 @ \$23.50; Southern Cold Blast Charcoal, \$27; Blackband Coke Softeners, \$23.50 @ \$24; No. 2, \$22 @ \$23; Hanging Rock and Jackson County Soft, \$22; Straight Coke Foundry No. 1, \$22.50 @ \$23; No. 2, \$21 @ \$21.50; No. 3, \$20 @ \$20.50; Coke Bessemer, run of furnace, \$22.50; Southern Coke No. 2, \$21.50 @ \$22; No. 2 1/2, \$20.50 @ \$21.50.

Bar Iron.—Considerable business has been placed during the week, at fair prices, which now seem to be steady at about 2¢ rates for carload lots of Common Bars, f.o.b. Chicago. All Muck Bar Iron is quoted about 2.10¢ higher. Quotations from store are still 2.20¢ @ 2.30¢, according to the size of the order.

Structural Iron.—An excellent business has been transacted during the past week, but the outlook is less cheerful on account of the local building troubles, which promise to check consumption for some time. The demand is active outside of the city, and prices continue as follows: Beams and Channels, 3.8¢, from store; Angles, 2.8¢ @ 3¢, from store, and 2.6¢ on cars, from mill; Tee's, 3.25¢, from store; Universal Mill Plates, 2.7¢, on cars, from mill.

Plates.—Business is dull. Tank Iron is quoted at 2.5¢ in carload lots, from mill. Store prices are as follows by dealers: No. 16 Sheet, 3¢; Nos. 10 to 14, 2.9¢; Iron Tank, 2.8¢; Shell, 3.25¢; Flange, 4.25¢; Steel Shell, 3.5¢; Flange, 4.25¢; Fire-box, 4.75¢.

Sheet Iron.—More inquiries are reported, with indications that buyers will soon take hold and place season contracts. Manufacturers are gradually nearing the end of their old orders, and are in a position to encourage negotiations. Common Black is still quoted on a basis of 3.1¢ on cars from mill for No. 27 and 3.4¢ from store. In Galvanized Iron a good business is being done for the season, although light sizes are less called for. Some cutting of prices is reported, but not enough to make necessary a change in quotations, which continue at 62 1/2 % discount for Juniata and 62 1/2 % and 5 % for Charcoal, by manufacturers' agents to jobbers. The jobbers quote 50 % and 15 % for Juniata and 60 % for Charcoal.

Merchant Steel.—A serious competition has been inaugurated recently in Tire, Sleigh Shoes and other miscellaneous Steels by some small establishments which are anxious to secure business. The result has been a weakening of prices in this respect, but large manufacturers look upon the break as only temporary and likely to be corrected as soon as these works get filled up with orders. In other respects the market continues about the same with quotations for ordinary Tool Steel at 8¢; Specials, 13¢ @ 20¢; Spring, 3¢ @ 4¢; Sheet, 7¢ @ 11¢; Bessemer and Open Hearth machinery, 3¢ @ 3.1¢.

Steel Rails.—Some sales of moderate quantities have been made for future deliveries. Eastern manufacturers seem to be desirous of securing orders, as they have recently taken several here at rates which the local mills refuse to meet. Quotations range from \$42 upward, according to circumstances.

Old Rails and Wheels.—Quotations for Old Rails range from \$23 upward. Small lots command a better price than large lots because of the hand-to-mouth business which

some works are pursuing in laying in supplies. A 500-ton lot sold at \$25.25, while negotiations for large lots are pending at \$23, offered. A sale of Old Steel Rails has been made at \$23.50, Indianapolis. Old Wheels are in moderate demand, with limited supply. Quotations range at \$21 @ \$21.50.

Scrap.—Very little new business is reported for the week. Dealers are accumulating large quantities in their yards with the expectation of a better demand in the near future. Nominal quotations are as follows per ton of 2000 lb.: Railroad Scrap or No. 1 Forge, \$20 @ \$21; Railroad Track, \$18 @ \$19; Mill or No. 1 Wrought, \$16; Light or No. 2 Wrought, \$10; Boiler Plates, \$15.50; Pipes and Flues, \$14; Stove Plate, \$11; Machinery Cast, \$14 @ \$14.50; Cast Borings, \$9.50; Machine Turnings, \$12; Axle Turnings, \$14; Coil Steel, \$16; Leaf Steel, \$17; Locomotive Tires, \$20; Horseshoes, \$20.50; Axles, \$23.

Nails.—While the Western Nail Association reaffirmed the card rate at their meeting last week, which makes the price \$2.15 in carload lots at the factory, offers are freely made of Steel Nails at \$2 at the factory, which is equivalent to \$2.15 at Chicago to largest buyers, and sales of a considerable quantity are reported at even less than these figures. Jobbers' prices for small lots are \$2.40 for Steel and \$2.25 for Iron, with 10¢ off in carload lots. Good sales of Wire Nails are reported at \$3.15 @ \$3.20 to jobbers, who ask about \$3.40 base for small lots.

Barb Wire.—The failures in this branch of trade have not affected prices, which keep tolerably steady, with a fair demand for the season, although carload lots are not much called for. Jobbers' quotations are 3.5¢ for Painted and 4.25¢ for Galvanized. For large lots manufacturers quote 3.3¢ for Painted and 4.05¢ for Galvanized.

Hardware.—The volume of trade is not so large as it was, partly on account of the local labor troubles, which cut off the demand for builders' Hardware, and partly on account of the decreased demand from the rural districts, caused by the farmers now giving their sole attention to tilling the soil. An advance in the price of Wringers is noted, in consequence of an advance by the manufacturers. Screws have also been marked up fully 20 per cent., the advance taking effect to-day.

Lead.—Prices in this market have moved upward in sympathy with the strength exhibited in New York and St. Louis. Sales of 600 tons of Pig have been effected at 4.15¢ @ 4.25¢. At the close of the week 4.3¢ was asked, with very little lead offering.

Mr. W. E. Stockton has terminated his connection with Messrs. Brown & Co., Wayne Iron and Steel Works, Pittsburgh, taking effect on the 9th inst. Mr. Stockton has represented this firm in Chicago for the past 22 years. He will continue to represent the Moorhead-McClane Company, of Pittsburgh, manufacturers of Black and Galvanized Sheet Iron.

Mr. N. B. Williams, Western manager of the Hartman Steel Company and the Apollo Iron and Steel Company, has removed his office to Room 24, Portland Block, corner Washington and Dearborn streets, Chicago.

Birmingham.

BIRMINGHAM, ALA., May 16, 1887.

Pig Iron.—The state of the trade at this point is hardly as satisfactory to manufacturers as it might be. Offers are lower, and a few sales have been made at 25¢ less than prices of two weeks ago. However, manufacturers are not in a position to be deeply concerned about prices for the next few weeks. Shipments are almost entirely on old contracts, these being now universally protected by the railroad rates guaranteed during the period of the suspension of the "fourth clause." Except for the general uncertainty of business the latter is now almost a nullity, its only serious effect being to prevent a guarantee of through rates on new business by certain of the railroads beyond the Ohio River. The restriction of shipment on all contracts is mainly chargeable to consumers, who, fearing the effect of the new law upon the movement of their products, do not wish to accumulate material, and have asked that it be held back.

Finished Iron.—Market almost stationary at \$2.10 for Merchants stock and \$2.30 for Tank Plates, the prices to which it fell back about a month ago. The disturbance of transportation is a more serious matter with this line than with Pig Iron, the greater part of the business being with the West, where the heaviest effects of the all-rail long-haul restriction must fall if it is enforced.

Nails.—Within a month Steel Nails have gone off as much as 50¢, though prices are now so irregular that it would be hard to verify any such statement. Two weeks ago from \$2.40 to \$2.50 was paid for delivery here; within the last week current quotations are from \$2.30 to \$2.35, while one hears in confidence of a purchase here and there a good deal below these figures even. Iron Nails have not suffered quite so badly as yet, \$2.25 being the rate of most of the mills that sell to this territory. The Alabama mills have sufficient business booked to justify them in merely meeting the reduction quoted by their eastern competitors.

Cast Pipe.—Local extensions for water and gas are taking practically all of the local product in this line. A good volume of inquiry comes from abroad though.

Coal and Coke.—Inasmuch as one furnace has been stopped for several weeks by fire at the Pratt shaft, the completion of the repairs and resumption of mining within the last few days is an event of some consequence. Work is progressing very satisfactorily on several new openings, which will swell the aggregate output very largely, if not, notably those of the De Bardeleben, Coal and Iron Company. Prices continue to be very stiff for the season.

Cleveland.

CLEVELAND, May 16, 1887.

Iron Ore.—Careful inquiry results in establishing the fact that only 125,000 tons of Ore were on the docks at all Lake Erie ports at the opening of navigation. This is less than half the amount on hand when the first cargoes arrived last year, and not one-fourth as much as was on the same docks when the new Ore began to come down in 1885. Dealers report that they have been obliged to reject several offers for Ore made during the past week, owing to the fact that the output of the particular mine inquired for had been sold. Still, the market has experienced something of a revival, and several sales of 1000-ton lots are reported. A 1500-ton lot of Bessemer Hematite Ore sold during the week for \$5.75. After repeated efforts the vessel men have succeeded in forcing the Ashland rate up to \$2.10 per ton. About 24,000 tons of new Ore arrived during the week, and probably 12,000 tons were received at other ports on Lake Erie. The amount of merchandise freight that is being offered lake vessels makes it seem quite probable that mine owners will have some difficulty in filling contracts this season. An immense amount of freight that, under ordinary conditions, would have been carried by rail will be carried by water during the next six months. The eagerness with which the vessel men are accepting consignments of goods to the exclusion of Ore makes both mine owners and dealers somewhat anxious. Ores have arrived during the week from Marquette, Ashland and St. Ignace, and several vessel loads from two harbors are expected down this week. About 35,000 tons have gone forward to the furnaces. Quotations are as follows:

No. 1 Specular and Magnetic Ores, Bessemer quality.....	\$6.50 @ 7.25
No. 1 Specular and Magnetic Ores, Non-Bessemer quality.....	5.75 @ 6.25
Red Hematite Ores, Bessemer quality.....	5.75 @ 6.00
Red Hematite Ores, Non-Bessemer quality.....	5.00 @ 5.50
Menominee Range Ores, Bessemer quality.....	5.50 @ 6.00
Menominee Range Ores, Non-Bessemer quality.....	4.75 @ 5.25
Gogebic Range Ores, Bessemer quality.....	5.50 @ 6.00
Ores for Mill Use.....	6.00 @ 7.00

Pig Iron.—The strike of the coke men has not depressed the local Pig Iron market. A large number of furnaces will go out of blast, and production will be largely curtailed. A knowledge of this fact has served to strengthen the market and stiffen prices. Several buyers who have been holding off for lower quotations have come into the market and asked for iron, doubtless fearing that they would not be able to obtain it later on at present prices. Quotations, f.o.b. cars Cleveland, four months, are:

Nos. 1 to 6 Lake Superior charcoal.....	\$24.00 @ 25.00
No. 1 Strong Foundry, Bessemer quality, per ton.....	21.85 @ 22.35
No. 1 Strong Foundry, per ton.....	21.35 @ 21.85
No. 2 Strong Foundry, per ton.....	20.85 @ 21.35
No. 1 American Scotch, per ton.....	21.50 @ 22.00
No. 2 American Scotch, per ton.....	20.50 @ 21.00
No. 1 Soft Silvery, per ton.....	20.50 @ 21.50
Mahoning and Shenango Valley neutral Mill Irons, per ton.....	20.00
Mahoning and Shenango Valley Red Short Mills, per ton.....	20.50

Old Rails.—The market is extremely dull, the only transaction reported being the sale of a 1000-ton lot of Old Rails at \$24. Old Wheels are quoted at \$21, with small inquiry.

Nails.—A further reduction of 5 cents per keg in the quotations for Iron Nails and Spikes is the only change noted.

Chattanooga.

Office of The Iron Age, Carter and Ninth Sts., CHATTANOOGA, TENN., May 16, 1887.

Pig Iron.—The present condition of the market is far from satisfactory. The elements that were at work giving it strength some few weeks since appear to be less active, and, notwithstanding the large consumption, prices have been gradually getting weaker. Within the past few days, however, there has been such an active inquiry that producers are quite encouraged. On Thursday of last week, a direct offer of \$14 at the furnace was refused for 2000 tons of Gray Forge. It is true the brand is a favorite one, and the furnace has had no trouble in the past in placing their entire output at full prices. The coke strike in the Pennsylvania regions is of considerable interest to the Southern districts, and the increased inquiry for Southern Irons may be due to this cause. A few contracts have been taken for round lots for future delivery, when the question of freights has not interposed objections, and it is thought that, as the time approaches when old contracts expire, most of the furnaces will have entered a sufficient number of orders to give them very little concern for the balance of the year. As near

as the market can now be judged, we can say that prices are ruling at \$17, \$16, \$15 and \$14 for the respective grades as they go down. Some favorite brands sell readily at these prices, and even higher, but on others prices are being shaded. No matter what the condition of the market may be, there are some Irons made in the Southern District that are always sold up to the capacity of the furnaces.

Miscellaneous.—A careful inquiry during the past week among the builders and contractors shows 473 buildings in actual course of construction in this city and the near suburbs, and the same active condition prevails in the surrounding towns.

Cincinnati.

CINCINNATI, May 16, 1887.

Pig Iron.—That the local market has been a dull, weak and ragged one will probably not be disputed by any one, but opinions concerning the probable conditions influencing the market between the present and the fall months differ widely. Prices have not been sliced off horizontally, but have suffered irregular drops ranging from \$1 to \$2 per ton extending over a period of six weeks, but not until within the past two weeks has the extent of the break been fully recognized. There may be some further decline, but of no special significance, before any advance is realized. It is claimed that the Coke ovens in the Connellsville district supply between 70 and 80 % of all the furnaces in the country, and should the strike of the handlers continue a large number of furnaces must be banked; in fact, some have already been forced to suspend operations. Stocks at the furnaces were slightly increased during March, but for April they will show considerable falling off. The general business of the country is good for this season of the year; funds have been attracted by speculation in real estate, gas and oil, but otherwise money is better distributed among the business community, while less has been absorbed in carrying miscellaneous securities. An impetus has been given to building, and it is only recently that labor troubles have clouded the outlook. The local clearing-house exchanges during April were the largest in the history of Cincinnati, and the month of May bids fair to surpass that of April. Manufacturers are busy with old orders, and new ones are not infrequent. The sales of Pig Iron, which have been made through Cincinnati during the week, have been of small amounts, but during the past few days there has been quite an increase in the number of orders booked for present and near delivery, buyers recognizing this as a good time to buy. We hear of sales of No. 2 Charcoal Foundry Southern Iron being sold as low as \$21, No. 2 Coke at \$19.75, and No. 2 Mill at \$18 per ton, but, as a rule, these prices are below sellers' views, and are for cash. We make revision of prices which are approximately for cash, f.o.b. cars at Cincinnati, as follows:

Charcoal Foundry.....	\$23.00 @ \$24.50
Hanging Rock, No. 1.....	21.00 @ 22.50
Hanging Rock, No. 2.....	21.00 @ 22.00
Southern No. 1.....	21.00 @ 22.00
Southern No. 2.....	20.00 @ 21.00

Coal and Coke Foundry.....	
Ohio Soft Stonecoal, No. 1.....	20.00 @ 20.50
Ohio Soft Stonecoal, No. 2.....	19.00 @ 19.50
Southern Coke, No. 1.....	21.00 @ 22.50
Southern Coke, No. 2.....	20.00 @ 20.50
Southern Coke, No. 3.....	19.00 @ 20.00
Ohio and West Pennsylvania Coke, No. 1.....	21.00 @ 22.00
Ohio and West Pennsylvania Coke, No. 2.....	20.00 @ 21.00

Forge.....	
Strong Neutral Coke.....	18.50 @ 19.00
Mottled.....	17.50 @ 18.00
Southern Coke.....	18.00 @ 19.00

Car-Wheel and Malleable Irons.....	
Southern Car-Wheel.....	26.00 @ 28.00
Hanging Rock, Cold Blast.....	27.00 @ 28.00
Hanging Rock, Warm Blast.....	24.00 @ 25.00
Lake Superior Malleable.....	25.00 @ 26.00

Manufactured Iron.—Has continued to sell well, and with old and new orders manufacturers are fully employed. Prices remain firm and are unchanged. We quote: Bar Iron, 2¢ @ 2.10¢; Charcoal Bar Iron, 3¢ @ 10¢; Sheet Iron, Boiled, Nos. 10 to 27, 2 1/4¢ @ 3 1/4¢; Sheet Iron, Charcoal, Nos. 15 to 25, 3 1/4¢ @ 4 1/4¢ per lb.

Nails.—Have continued in moderate demand and easy, but prices are without quotable change and are \$2.25 per keg for rod, to 60d. Iron, and other sizes at proportionate rate. Steel sell at \$2.35 per keg.

Detroit.

CHARLES HIMROD & Co., dealers in Pig Iron, Detroit, Mich., report, under date of May 16, 1887, as follows: Dealing in Pig Iron recently has been so meager that there has hardly been enough trade to definitely establish market prices. Larger trading has been resumed, however, during the past week, and prices are considerably off on the whole list. Lake Superior Charcoal Iron, however, which is our only native production here, has more elements of strength than any of the other grades, although the price is off on this, too, to some extent. Offers are free from the South for Iron to be delivered any time this year, at prices which ought to effect some business. A large number of inquiries are being made, and considerable Iron will be sold during the latter part of this month and the early part of June. We quote the market to-day as follows:

Lake Superior Charcoal, all numbers.....	\$23.00 @ \$24.00
Lake Superior Coke, All Ore.....	28.00 @ 24.00
Lake Superior Coke, Cinder Mixed.....	21.00 @ 22.00
Standard Ohio Blackbands.....	23.00 @ 24.00
Southern No. 2.....	30.75 @ 31.50
Southern Silvery.....	21.00 @ 22.00
Jackson County, Ohio Silvery.....	20.50 @ 22.50
American Old Iron Rails.....	23.50 @ 25.00
Old Wheels.....	20.00 @ 21.00

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Trade Report.

General Hardware.

Prices remain without material change, the tone of the market being fairly firm, with advances in some lines, the most important of which is in Screws, the particulars of which are given with other advices, below. The volume of trade is also reported larger, and a fair business is doing, with a cheerful feeling, and a hopeful outlook. The result of the business this year thus far, while not up to the most sanguine expectations, has in the main been gratifying, and aggregates considerably in excess of that during the same period last year. The general conditions of trade are regarded as healthful, and the feeling prevails that a continuance of good business may be anticipated for some time to come. While it is not a time when merchants should buy in excess of their reasonable requirements, the state of the market justifies the purchase of such goods as their regular business calls for.

NAILS.

The market continues in a very unsatisfactory condition, offerings being made from few sources. There has been a little increase in the number of inquiries for small lots to cover immediate requirements, but the great majority of buyers are holding off, covering only their present wants.

BARB WIRE.

The market presents no new features, being in substantially the same condition as at our last report. Four-Point Galvanized may be quoted at 4½ cents, in carload lots. The demand is moderate.

MISCELLANEOUS PRICES.

The firmness in the Screw market, to which we have from time to time alluded, owing principally to a better understanding among the manufacturers and the diminished competition, has resulted in a material advance in the goods. Under date May 14, the manufacturers announce a discount of 70 per cent. on Iron Flat Head Screws, instead of 75 per cent. as heretofore, with a corresponding change in some of the other goods. The new prices are as follows:

	Per cent.
Iron, Bright, Flat Head.....	70
Iron, Bright, Round Head.....	65
Iron, Blued, Flat Head (add 5 per cent. to net amount of invoice).....	70
Iron, Blued, Round Head.....	65
Iron, Yellow, Flat Head.....	65
Iron, Yellow, Round Head.....	60
Iron, Pinched Head.....	65
Iron, Japanned, Flat Head.....	65
Iron, Japanned, Round Head.....	60
Iron, Tuned, Flat Head.....	65
Iron, Tuned, Round Head.....	60
Brass, Flat Head.....	65
Brass, Round Head.....	60
Bronze, Flat Head.....	65
Bronze, Round Head.....	60

For some time the manufacturers have been holding Screws quite firmly at established prices, but the amount of goods in the hands of jobbers, and the irregular prices at which they were sold, have contributed to the irregularity in price which has prevailed in the market at large. The fact of stocks thus held and offered has unquestionably delayed the advance which has now been made, the manufacturers waiting until the supply of goods in the hands of second parties was considerably diminished.

The Victor Mfg. Company, Newburyport, Mass., have issued a new and finely printed catalogue and price list of their goods. The illustrations are finely executed, and indicate the special features of the goods. Beside the Victor Barn Door Hanger, their Stay Roll, Tidy Umbrella Holder, Heel Protector, Heel Nailing Jack, and other goods are illustrated. The following is their discount sheet, terms 30 days, or 2 per cent. discount for cash within 10 days of date of invoice, freights equalized with Boston and New York:

	Discount per cent.
Victor Barn Door Hangers.....	40, 10 & 7½
Victor Barn Door Rail.....	40, 10 & 7½
Victor Barn Door Stay Rolls.....	40, 10 & 7½
Tidy Umbrella Holder.....	35
Heel Protector.....	35
Victor Heel Nailing Jack.....	35
Interchangeable Lock Stencils.....	35
No. 1 Victor Rotary Can Opener.....	15
No. 2 Victor Rotary Can Opener.....	30
Spring and Drive Punches and Tubes.....	net
Rivet Nut Setts.....	net
Lemon Drills.....	net
Sample Can Opener.....	net

Quackenbush, Townsend & Co., 85 Chambers street, New York, are offering a lot of Remington Hay and Manure Forks and Socket Hoes at special prices, which are mentioned in their announcement on page 18. The goods are described as all in good condition, and orders for the whole or part will be accepted.

Reece's New Screw Plates, manufactured by Butterfield & Co., Derby Line, Vt., are sold at discount 33½ to 33½ and 5 per cent.

The conferences which have been taking place among the manufacturers of Wire Nails have thus far been without definite result, and in the meantime prices continue somewhat irregular, with a lower tendency. In their circular, May 14, the American Screw Company announce discount 50 and 10 per cent., instead of 50 per cent., which was their former quotation, and at the same time it is to be observed that they add a quotation on Standard Penny Wire Nails, Steel, the base price of which is mentioned as \$1.60 per keg, a figure from which it is assumed that concessions are made with more or less freedom. The decline in the price of Cut Nails has naturally had considerable influence on the price of the Standard

Penny Wire Nails, which are quoted at prices materially lower than the nominal card rate. The prominence with which the Standard Wire Nails are coming into the trade is to be noted, as they are rapidly taking their place as a staple article, entering increasingly into competition with the Cut. The extent to which they are sold interferes with a proportionate increase in the sale of the Nails in papers, a department of the business which has not the relative importance that it formerly possessed.

H. Chapin's Son, Pine Meadow, Conn., issues a new catalogue of rules, Planes, Gauges, Molding Planes, Plumbs and Levels, Door-steps, Hand-screws, &c., which will be of interest to the trade. It is copiously illustrated, and suitable descriptions of the goods are given. It is accompanied by the following discount sheet, terms 30 days or 2 per cent. for cash in 10 days from date of invoice.

	Discount Per Cent.
Boxwood Rules.....	80 & 10
Ivory Rules.....	50
Miscellaneous Rules.....	60 & 10
Bench-planes, Common "Pearce".....	50
Bench-planes, Extra and Premium.....	40
Bench Planes, with English Iron instead of American.....	35
Ship Planes.....	40
Miscellaneous Planes.....	40
Bench Planes, Apple, Box and Rosewood.....	35
Carriage-Makers' Tools.....	35
Molding Planes.....	40
Grooving Plows.....	40
Gauges, School's Patent.....	60 & 10
Gauges, Marden's Patent.....	50 & 10
Plumbs and Levels, Non-Adjustable.....	70 & 10
Plumbs and Levels, Patent Adjustable.....	70 & 10
Pocket Levels.....	70 & 10
Level Glasses.....	60 & 10
Hand Screws.....	30 & 10
Turning Saw Frames.....	30 & 10
Chisel Handles.....	65 & 10
File and Awl Handles.....	65 & 10
Plane Handles.....	50 & 10
Saw Handles.....	50 & 10
Door Stops, Birch only.....	60 & 10
Door Stops, Rubber Tipped, Birch only.....	60 & 10
Spike Shaves, Mosher's Patent.....	50 & 10
Box Scrapers.....	50 & 10
Plane Irons.....	20
Plane Stops.....	20

The Association of the Strap and T-Hinge Manufacturers meets to-day, but at the time of our going to press no report has been received as to their action. The general opinion is that the association will be continued notwithstanding the withdrawal of Roy & Co.

At the recent meeting of the manufacturers of Iron Rivets, no change was made in quotations. The existing arrangements were referred to as working very satisfactorily, prices being regularly maintained.

The general line of Bolts, such as Carriage, Tire, &c., remains firm, but Machine B Its and Bolt Ends have receded slightly, and are quoted at somewhat lower figures.

Some of the manufacturers of Coil Chain in recent quotations make slight advances on some of the larger sizes, prices otherwise remaining substantially as before. The market is regarded as firm, and the demand fair.

WHAT THE TRADE SAYS.

The following forcible letter is from a well-known house of recognized prominence. It relates to an abuse which prevails to a large extent in the purchase and sale of Hardware, and which bears with especial hardship on the manufacturer, reducing his profits, bringing an element of uncertainty into his business, and causing much irregularity in prices. Our correspondent brings the matter up with reference to Nails, a line of trade from which his illustrations are drawn, but the mischievous practice prevails as well in many other branches of Hardware. It is indeed often carried a step further than in the transactions described below, as the jobber in many cases regards the manufacturer as under obligations to advise him prior to an advance, giving him an opportunity to put in his orders, and takes it as a personal injury if he is not thus permitted to cover himself with such a conditional order as our correspondent refers to. The matter is one of great importance to the manufacturer, and the principles and results of the practice are deserving the careful consideration of the trade:

As one of the victims connected with a branch of manufacturing that suffers at both ends of a contract, we write you in the hope that the matter may be thoroughly ventilated in your vigorous editorials. Your influence, which is on the right side of important trade questions, and in the interest of better systems, will aid to break up a practice which is vicious and unbusinesslike.

What we refer to can best be expressed by an example or two: A. B. & Co., Nail manufacturers, sell to C. D. & Co. 5000 kegs of Nails, at, say, \$2.25, with a full understanding between buyer and seller that if the price does not advance, C. D. & Co. will not be asked to take the Nails, and if the advance takes place, be it 5 cents or 50 cents, C. D. & Co. get the Nails at \$2.25. If the price remains as it was at the time of purchase, or declines, the order is cancelled by consent of A. B. & Co. Again, C. D. & Co. buy from A. B. & Co. 5000 kegs of Nails at \$2.25, with the impression at the time that they have made a good purchase. If the price advances they demand every keg, but should a decline occur they utterly refuse to take the Nails, or demand that the price charged be at the reduced rate, and the custom for the past few years has been for A. B. & Co. to grant both advantages. In some instances, if the Nails have been delivered and charged at the price agreed on, and the price declines before the Nails are sold, C. D. & Co. ask a reduction from their payments equal to the decline.

You can readily see the commanding position such a custom gives the jobber over the manufacturer, and how fruitful it must be of mischief. By this method the jobber can always undersell the manufacturer if

the latter asks the latest card price. This system is one of the chief factors in the present demoralized condition of the Nail trade. If when the jobber contracts for a specified number of kegs of Nails he were obliged to take them whether the price went up or down before delivery, he would buy only what his trade required, and, having bought them, would not be so ready to cut prices and lose money. It makes a great difference whose money is lost, the manufacturers' or his own.

The manufacturer expects and is obliged to stand by his contracts when he buys Iron or Steel from which he intends to make these Nails. It never occurs to him to ask a furnace company to cancel his order because the price declines, or to ask a rebate equal to the decline. Indeed it would be useless for him to do so, as the furnace company expects to deliver the Iron at the price agreed on, however much the price may advance in the meantime.

As we say above, the jobber has the advantage at both ends, and takes no risks whatever. If the price advances, he gets the Nails; if it declines, he either cancels the order or gets a rebate equal to the decline.

It is not difficult to see the position the manufacturer occupies under such a pernicious system. Some have objected to this for years. Indeed, all have objected, but a great many yield because they say it is the custom and others do it, and the jobbers demand it.

A correspondent speaking of the subject of short time on sales, says:

I think it one of the best things that could be done. Many retailers would be better off if there were no long-winded settlements to make, and they would not lay in stock enough for two seasons just because pay day seemed so far away when buying. But the time comes, however, when a settlement is called for, and then the dealer tries to sell some of his stock of stores to meet his obligations. In some cases he may have to give them away or get for them just about what they cost, less freight, and then he may not be in a position to settle his account with the manufacturer. But this is not all. His neighbor may be a man less fond of making a big show and purchased only enough goods for his trade, paying as he went. He works hard to dispose of his goods, but owing to the low figure at which stores have been offered by his competitor he finds difficulty in getting much, if any, profit. I for one would favor giving dealers who have stores bought at this date and not paid for, all the time they could reasonably ask for; but after this date accounts to be settled in 60 or 30 days, but not a day longer. This would give good men in the business a chance, and there would be less bills lost by manufacturers and less sheriff sales to hurt cash buyers.

ITEMS.

A. Field & Sons, of Taunton, Mass., have removed their New York warehouse to No. 88 Chambers street, where they will, as heretofore, carry a full line of their goods. Their Philadelphia address is 409 Commerce street, and Weir & Wilson are their Baltimore agents.

J. B. Field & Co., 77 Woodward avenue, Detroit, issue a catalogue devoted to goods connected with summer pastimes, including Anglers', Hunters' and Athletic goods. It is a well-arranged, fully-illustrated pamphlet of 60 pages, in which are exhibited a large variety of goods in the indicated lines. The front cover, of unique and artistic design, is, we understand, the drawing of J. B. Field, who has been for many years identified with the sale of Sporting Goods in Detroit, in which relation he is pleasantly known to buyers throughout Michigan and territory tributary to Detroit. The firm have established a business at the address named above in a newly-erected stone building, 4 stories and basement, equipped in the most convenient manner for the sale of their goods.

The Royal Dauber and Mud Scraper, which is manufactured by Peabody & Parks, Troy, N. Y., and illustrated in their announcement on page 38, is reported to be meeting with a gratifying reception from the Hardware trade. The manner in which the Dauber is made, the quality of the bristles, and the utility of the Scraper are points specially alluded to.

The special list, No. 11, of Paine, Diehl & Co., Philadelphia, Pa., represents a somewhat enlarged line of goods, presenting, as it does, in addition to those with which the trade are familiar, a few novelties. Among these are the P. D. & Co. Patent Egg-Beater, Tea and Coffee Lid Holder, Glove Buttoner and All-Steel Ice-Pick.

At a meeting of the stockholders of the Gilbert Lock Company, held May 4, 1887, the following directors were chosen: J. K. Osborne, G. M. Lance, A. A. Hearty, Thomas Devlin, John M. Riley, John Connor and J. Porter. On the same day the board of directors chose the following officers: J. K. Osborne, president and treasurer, and G. M. Lance, secretary.

F. E. Myers & Brother, Ashland, Ohio, have issued a convenient list of the Haying Tools of their manufacture. It describes their assortment of Carriers, Hay Forks, Sheaves, Pulleys, &c. Their new Shirl Sling Attachment is also illustrated and their Grapple Fork.

F. B. Gleason and A. J. Gleason have formed a copartnership for the purpose of carrying on a general Hardware business at Brattleboro, Vt., under the firm name and style of F. B. Gleason & Co.

E. C. Meacham Arms Company, St. Louis, Mo., issue a comprehensive price current of some of their leading goods, including Baseball and an assortment of Summer Sporting Goods, Fishing Tackle, Guns, Rifles, Traps,

Targets, Hammocks, &c. The pamphlet is printed on white paper, fully illustrated and indexed through. It is accompanied by a discount sheet, which serves as a key to the quotations which are given in the text.

Announcement is made, May 1, that by act of the Legislature the name of the Ayres Mfg. Company, Worcester, Mass., was changed to the Hamblin & Russell Mfg. Company.

John T. Henry, Hamden, Conn., a description of whose Postal Card File is given on page 29, expects in a short time to have his Orange Shears ready for the market.

Among other indications of increased enterprise and activity on the part of American manufacturers in reaching out for foreign trade we may mention that A. Straus, manager of the Vulcanite Emery-Wheel department of the New York Belting and Packing Company, New York, sailed for Europe, on the 11th inst., in search of business.

The Hilger Hardware Company and the Witte Hardware Company, St. Louis, Mo., issue pamphlets containing preliminary pages of their new catalogues and representing a varied line of season goods. Of these illustrations and list prices are given. It is intimated that additional sections of the catalogues will be issued from time to time, and when the works are completed they will be sent out in book form.

The Branford Lock Works, Branford, Conn., and 97 Chambers street, New York, issue price list No. 2, a pamphlet giving consecutive list prices of their goods. It is accompanied by a sheet of discounts and by an extra page for insertion in their 1886 catalogue, giving new descriptions of finish, as follows:

Oriental Design Bronze Metal.	
No. 1 Finish, Light or Natural Color Surface and Black Background.	
No. 3 Finish, Light or Natural Color Surface and Black Background.	
Ivy Design Bronze Metal.	
No. 3 Finish, Light or Natural Color Surface and Black Background, in Imitation of Cross-bars only.	
No. 5 Finish, Blue-Black Background, Light or Natural Color Surface.	
Plain Bronze Metal.	
No. 1 Finish, All Light or Natural Color.	
No. 25 Finish, All Dark Brown.	
Ornamental Iron.	
Branford Bronzed—Bronze Plated Surfaces and Black Background, in Imitation of Our No. 3 Finish Bronze Metal.	
Iron Bronzed—Bronze Plated Surfaces and Black Background, in Imitation of Our No. 1 Finish Bronze Metal.	

It is also stated that all Branford Bronzed goods described in their 1886 catalogue will hereafter be made with bronzed plated surfaces and black background. C Bronzed and D Bronzed finish are discarded.

Many complaints are made of a falling off in the volume of business with Canada, which is referred to as being seriously interfered with by the Canadian tariff and the influence of the Interstate Commerce Act. While the effect of the latter is probably exaggerated, there can be no doubt that in some lines it results in checking trade which heretofore has been carried on.

Among the Special Notices on page 18, Hardwaremen will observe one in which "Retail" advertises for a gentleman to take charge of the retail department of a large Western Hardware house. While the name of the firm is not announced, we may say that it is a leading house, occupying a high position, and the opening thus presented to those who have the requisite qualifications would seem to be an exceptionally favorable one.

Merchant & Co., Philadelphia, issue illustrated circulars relating to the Star ventilators for which they are general agents. A sectional view of the ventilator shows its construction, and a general description is given of its working and the applications to which it is suitable. A number of testimonials are printed from those who have used the Star ventilator to advantage. Merchant & Co. are also sending out advertising cards in the form of blotters. One relates to Babbitt metal and another announces that they make a specialty of supplies for lamp and gas fixture manufacturers, railroad furnishing houses, metal spinners and workers in brass and copper of every description.

The new Nail factory of the Lock Haven Nail Company, Lock Haven, Pa., were started on Monday, May 16, with 20 Nail machines, with an estimated capacity of 800 to 900 kegs a week. The Philadelphia selling agents will be C. W. & H. W. Middleton.

William Blair & Co., of Chicago, issue a circular on the 11th inst., quoting wholesale prices for Tinners' Stock, Refrigerators, Freezers, Churns, Lawn Mowers, &c. In it they say:

Business during April was largely in excess of last year, and continues good. The Interstate law has caused some derangement in freight rates, and the railroad companies have made some material changes in classification, but it makes little difference to the merchant how much freight he pays, provided he pays no higher rate than his competitor. It all comes out of the consumer. The principal complaint is from those who are likely to lose some undue advantage heretofore enjoyed, and which the law was specially designed to prevent. The decline in the price of Nails was not unexpected, as the previous advance was disproportionately to other products; consequently the decline has not affected any other lines of goods, and prices generally are firmly held.

The Grant Wire and Spring Company, of Lockport, Ill., have established an office in

Chicago, at 218 Lake street, with Marshon & Bancroft. They manufacture all kinds of Steel Wire and every description of Wire Springs. The company was formerly known as the Grant Wire Company, but a reorganization has recently been effected and facilities have been considerably increased, although continuing under the management of the same officers.

Hanchett and Sheldon, of Duluth, Minn., have purchased the stock and Hardware business of H. W. Pearson & Co., and have also associated with them Mr. F. G. Stevens, of Janesville, Wis. The new firm name will be Hanchett, Sheldon & Co. Their business at Janesville, Wis., will in no way be affected by these changes.

The Chicago Wire and Iron Company have been organized at Chicago, with a capital of \$50,000, for the sale of Wire and Iron goods. Incorporators, Eben B. Smith, Frank P. Smith and Willis B. Smith.

AMERICAN COMPETITION IN THE COLONIES.

The last issue of the London *Ironmonger* contains the following letter from a subscriber in Newcastle, N. S. W., which will be of interest as touching on the question of the position of American goods in the colonies:

We hear at present a great deal said of the sad state of trade in England. Of course there must be a cause for it, and what is the cause? It is, in my opinion, the defective training of English workmen and their masters. In the first place we are bred to believe that we are the foremost nation in the world with regard to manufactures. This may have been true at one time, but it is not so now. The fact is we are behind America and Germany. These nations are better educated, and the result is that they produce a better class of goods and more suited to this age. The old-fashioned and clumsy articles manufactured now in England do not suit the world. At one time there was no choice, but now it is different; other nations have come to the front offering things of newer and choicer designs—the result of higher intelligence. The pride of the English masters and the ignorance of the English workman will not allow them to learn better. What do we find with regard to the masters? They are not mechanics, as they should be. Any man to be successful as a manufacturer should be brought up to the trade, so that he may know when any article is turned out as it should be. The cause of the success of England's rivals; they are practical people. Then what do we find abroad? Foreign governments appoint as consuls business men, or men who have been engaged in trade. These men endeavor to forward the interests of their countries in trade.

What do we find with regard to English Consuls? As a rule they are people of no business capacity; in fact, the situation has been found for them because they are unfitted to get along in the world otherwise. As an instance of the difference of countries, I can send postage to America for any small article or newspaper without any loss, and where the sum is too small for a draft, the Consul sees to the exchange. Some time ago I had occasion to send in stamps 5 to a large firm in England, and they wrote me not to send any more, as they were of no value. Then, with regard to the English workman. He is brought up to believe that nothing is equal to his own work, and he reads of "German rubbish" and "Yankee gimcracks," and believes it. If by chance he is sent samples of any foreign make like his own he makes it badly, as a rule. Not long since I had some Locks made after the American pattern, and when opened I found that they sent no escutcheons nor screws, and lacked the neat cardboard boxes, and they charged more for them than I could get them for in America. Then, with regard to American-pattern Scissors. Some makers advertise these patterns of English make, but they are inferior in every way in style and quality. Again, Shovels are sent that would need one to sit down to use them. I was amused to read some time ago of the loss of the trade of a knife called the "Wadley flat back," a knife that was very much used at one time. The fact is that the smallest boy nowadays would hardly accept this article as a gift. One would as soon think of riding in an old-fashioned stage-coach as use the like. In conclusion, I would recommend that manufacturers who intend bringing up their sons to follow in their businesses be taught in such a manner that they will understand the smallest details. Then the consuls should be business people who will forward the trade of the nation. As to the workman, he should be taught up to a higher standard, and be placed within the reach of technical schools, and he should be also undeceived with regard to his being any better than others in the race for place in life.

Metal Market.

Copper.—There has been a little better demand for speculative purposes in Copper. The general public appears to be disposed to look upon the present prices of copper as worth attention. Large orders for future deliveries have been and are still in the market, but it is difficult to get dealers to sell long futures at the limit in hand, however, about 200,000 lb. of Lake Ingot Copper have been sold this week at 10.20¢ for September and October deliveries, and at that figure there are buyers for large lines, but sellers now are asking for small lots 10.25¢, and for larger lines 10.30¢, which checks further operations. On the spot some parcels for investment have been taken at 9.95¢, and more will gradually be absorbed at that figure. Baltimore and Orford could have been obtained at 9.20¢, but not below, with buyers at a trifle above 9¢. In London Chili Bars were £39. 7/6 on the 12th, 13th and 15th, declining since to £39. 5/4, at which they close, while Best Selected has receded

Trade Report.

from £44. 15/ to £44. 10/. Export of and charters in Chili during the first four months amounted to 11,380 tons of fine Copper, against 15,541 during the corresponding period of 1886 and 15,938 in 1885. The import of American Copper into Liverpool and South Wales during the first four months was 1112 tons fine, against 4460 last year and 7231 in 1885. The visible supply of Copper in England and France on May 1 was 56,172 tons, against 61,069 in 1886, and 55,384 in 1885. The deliveries in England and France during the 12 months ended April 30 were 87,462 tons, against 99,507 and 102,848. Price of Chili Bars, May 1, 1887, £39. 7/6; May 1, 1886, £41. 7/6; May 1, 1885, £43. 5/; and May 1, 1884, £56. 10/.

Tin.—From London we have had the usual quotations from £104. 5/ up to £104. 15/, on the spot, manipulated down by the bears again to £104. Here our market has shown very little animation, in consequence Tin is very scarce and is concentrated in a few hands, with buyers at 23¢, but nothing to be had below 23 20¢, possibly 23.15¢ might buy; 22.95¢ and 23¢ has been paid for May delivery, and 22.90¢ for June and July delivery, the turnover having been small, below 150 tons in all. This has been caused more by want of sellers than want of buyers. The shipments from the East, as cabled during the first 14 days of the present month, have been small, only 500 tons to Great Britain and the United States combined. Though the position of the article remains favorable, it cannot be denied that the buyers would like to see a break here. There is no falling off in the consumption, in consequence of an advance of a quarter of a cent, and even should Tin further advance it cannot make any material difference as far as the actual use of the article is concerned. One thing, however, is certain—that consumers who distrust the high prices here are only buying from hand to mouth, and consequently have no stock whatever to fall back upon, and are thus compelled to enter the market more frequently than they would have to do if they had any stock. This morning the London quotation is £104 for spot Straits and £104. 10/ for three months. **Tin Plates.**—A good inquiry continues to be noticeable in our own market; stocks here and in the interior are comparatively light, and under these circumstances and the steady market in Liverpool quotations remain as firm as ever. Besides the advance in Tin exercises some influence by causing greater firmness on the part of holders of Tin Plates. The following are quotations for large lines, 3 box: Siemens-Martin Steel, Charcoal Finish, \$4.75 @ \$5.15; Coke Finish, \$4.60; Terns, \$4.15 @ \$4.25; Coke Tins, \$4.27 1/2 @ \$4.35.

Lead.—The cheap operator, who up to last week has for some time been a bear in the market, has absorbed during the week under review some 2500 tons East and West, all the way up to 4.55¢, and the market may for the moment be called in a state of transition; outside of these purchases there have been taken by consumers in lots some 500 to 600 tons of Common Domestic at between 4.45¢ and 4.50¢. The market closes very strong at 4.55¢ @ 4.60¢, asked, while at St. Louis the asking price is 4 1/4¢, and in Chicago, 4.30¢; included in the above quantity of 2500 tons purchased by the leading spirit in the market, there was 1000 tons Richmond, of which it is asserted 4.55¢ had to be paid to secure them. This morning the cable reports Spanish unaltered £12. 12/6, while English Pig has declined from £12. 10/ to £12. 7/6.

Spelter and Zinc.—There is still considerable disappointment as regards the local demand for Common Domestic Spelter, which continues slack, leaving quotations unaltered—4.40¢ @ 4.60¢, while Silesian may nominally be quoted 4.85¢ @ 4.87 1/2¢. The London market for Silesian Spelter has advanced from £14 5/ to £14. 7/6. **Sheet Zinc.**—A fair demand has prevailed, as heretofore, without changing prices, which remain 6 1/2¢ @ 6 3/4¢ for Domestic.

Antimony.—The market has been featureless, sales not exceeding a moderate volume to fill the current requirements. We quote Cookson, as heretofore, 9¢, and Hallett 7 1/2¢ @ 7 3/4¢, the latter remaining unaltered at \$31 in London.

New York Metal Exchange.

The following sales are reported:

THURSDAY, May 12.	
20 tons Tin, May	23.30¢
20 tons Tin, May	23.35¢
25 tons Tin, May	23.30¢
10 tons Tin, May	23.25¢
10 tons Tin, July	23.30¢
10 tons Tin, August	23.30¢
10 tons Tin, June	23.30¢
40 tons Tin, June	23.25¢
20 tons Tin, buyer's option to June 15.	23.25¢
10 tons Tin, June	23.10¢
10 tons Tin, May	23.05¢
25 tons Tin, May	23.10¢
32,500 lb Lead, spot	4.45¢
32,500 lb Lead, September	4.47 1/2¢
FRIDAY, May 13.	
10 tons Tin, June	23.10¢
10 tons Tin, July	23.05¢
20 tons Tin, May	23.15¢
40 tons Tin, May	23.00¢
10 tons Tin, May	23.15¢
232 tons Lead, June	4.50¢
16 tons Lead, spot	4.47 1/2¢
50 tons Lead, May	4.47 1/2¢
150 tons Lead, June	4.50¢
16 tons Lead, Aug.	4.50¢
16 tons Lead, July	4.50¢

SATURDAY, May 14.	
10 tons Tin, May	23.05¢
25,000 lb Lake Copper, May	9.85¢
100 tons Lead, June	4.30¢
16 tons Lead, August	4.50¢
50 tons Lead, Sept.	4.50¢
MONDAY, May 16.	
30 tons Tin, July	22.90¢
20 tons Tin, May	22.90¢
10 tons Tin, May	22.90¢
125,000 lb Lake Copper, September	10.20¢
25,000 lb Lake Copper, October	10.30¢
25,000 lb Lake Copper, May	9.95¢
50,000 lb Lake Copper, spot	9.95¢
16 tons Lead, spot	4.50¢
80 tons Lead, June	4.50¢
TUESDAY, May 17.	
10 tons Tin, May	23.10¢
10 tons Tin, July	22.90¢
16 tons Lead, spot	4.55¢
32,500 lb Spelter, June	4.57 1/2¢

Coal Market.

Measures to shorten production were discussed in Philadelphia on Tuesday, at a meeting representing the Pennsylvania, Reading, Jersey Central, Lehigh Coal and Navigation, and Lehigh Valley railroad companies, and "the general sentiment" favored a suspension of mining for one week, commencing on Monday next. Without any formal agreement several companies will act simultaneously in accordance with this view. In New York at some of the Coal agencies to-day the fact is mentioned that neither the Pennsylvania Railroad Company, the Delaware, Lackawanna and Western nor the Pennsylvania Coal Company suspend, the latter being still engaged upon their allotment for May, in making up the aggregate of 2,500,000 tons. It is likely, too, that the Pennsylvania Railroad Company prefers to maintain its policy of isolation and independence. The demand for manufacturers' sizes is very large, which alone relieves the general dullness, following a week or two of unusual activity. Mining troubles cease to cause uneasiness. Prices are upheld, except as to the lower grades.

Bituminous Coal is in good demand at \$2.10 to \$2.50 f.o.b. In New York prices are irregular.

The total amount of Anthracite sent to market for the week was 640,800 tons, about the same as for the corresponding week last year; total since January 1, 11,491,705 tons, compared with 10,607,090 for the same time in 1886. The Coal shipments of the Reading Railroad so far this year, 3,804,132 tons, an increase of 550,611 tons over the same period of last year. Shipments by the Pennsylvania, 3,606,635 tons, or an increase of nearly 500,000 tons.

Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Heavy Copper	20¢	0.07
Light Copper	18¢	0.06
Copper Bottoms	16¢	0.05
Brass, Heavy	14¢	0.04
Brass, Light	12¢	0.03
Composition	10¢	0.02
Lead, Heavy	8¢	0.01
Tea Lead	6¢	0.005
Zinc	4¢	0.005
Wrought Iron	2¢	0.005
Light Iron	1¢	0.005
Stove Plate Iron	1¢	0.005
Machinery Iron	1¢	0.005
Grate Bars	1¢	0.005
Old Rubber	1¢	0.005
White No. 1	1¢	0.005
White No. 2	1¢	0.005
Canvas, No. 1	1¢	0.005
Canvas, Cotton, No. 1	1¢	0.005
Canvas, No. 2	1¢	0.005
Seconds	1¢	0.005
Soft Woollens	1¢	0.005
Mixed Rags	1¢	0.005
Unwashed Rags	1¢	0.005
Unwashed Rags, No. 1	1¢	0.005
Unwashed Rags, No. 2	1¢	0.005
Book Stock	1¢	0.005
Newspapers	1¢	0.005
Waste Paper	1¢	0.005
Kentucky Bagging	1¢	0.005
Kentucky Bale Rope	1¢	0.005
Kentucky Bagging	1¢	0.005

Louisville.

LOUISVILLE, Ky., May 17, 1887.

Pig Iron.—Some good sized sales of Iron have been made during the last week, but show a decided decline in price. We revise quotations accordingly. The majority of furnaces are still holding out of the market on Nos. 1 and 2 Foundry, and No. 2 and Gray Mill. Most furnaces are holding at full market prices, but a few small lots could probably be bought at inside figures. There are few buyers in the market, and none at all except at close figures. Buyers, generally, look for the decline to continue, while sellers generally believe that when the activity which always commences in the middle of the year starts in, it will send prices up rapidly. There is therefore very little urgency on the part of either buyers or sellers, and the market is quiet in consequence. We quote for cash as below:

Southern Coke, No. 1 Foundry	20.50 @ 21.00
" " No. 2	19.50 @ 20.00
Hanging Rock Coke, No. 1 Foundry	19.50 @ 20.00
Southern Charcoal, No. 1 Foundry	21.00 @ 22.00
Silver Gray, different grades	18.50 @ 19.00
Southern Coke, No. 1 Mill, Neutral	18.50 @ 19.00
" " No. 2	18.50 @ 19.00
" " No. 1 " Cold Short	18.50 @ 19.00
Charcoal, No. 1 Mill	19.00 @ 20.00
White and Mottled, different grades	16.50 @ 17.50
Southern Car-Wheel, standard brands	25.00 @ 26.00
Southern Car-Wheel, other brands	23.00 @ 24.00
Hanging Rock, Cold Blast	22.00 @ 23.00
Hanging Rock, Warm Blast	22.00 @ 23.00

W. B. BELKNAP & Co., Louisville, report as follows, under date of May 16, 1887: Business during the past week proved larger in volume than for the two preceding weeks. At the same time the tone of the market is not encouraging. Buyers feel this and are reducing their purchases to smallest amounts consistent with pressing demands, but should a turn come in Nails or Wire it would develop a speculative demand, which would very speedily

alter the complexion of things. Freight to and from interior points are becoming better settled, so that some of the uncertainty incident to the operation of the Interstate Commerce bill is being dissolved. At the same time it cannot be doubted that that law precipitated the declines which have occurred in many of the staple articles. Unripe legislation and commerce do not go hand in hand, and the former is apt to be the worst obstacle with which the latter has to contend.

Bar Iron.—There is some disposition to shade prices by the mills, though nothing apparent yet like a break. The demand for strictly bar sizes continues good, particularly such as enter into car and wagon building.

Hoops and Sheets.—There is little change to be noted in these. Demand only moderate and likely to continue so.

Nails.—The demoralization incident to the great decline in Nails which took place a short time since still continues. It is always an error to suppose that a sudden and great drop is going to restore confidence. Anything that is agreed on in the meetings is subject to individual action later, and in so far from increasing the immediate demand, the decline has undoubtedly had the effect of checking it.

Wire Nails.—Continue to grow in favor and are bound to exercise material influence on the Nail market.

Wire.—There has been an unusually large demand for Plain Wire, and prices are well upheld. The season for heavy consumption of Barb Wire is mainly over, but it is jobbing fairly in small lots. Prices have declined more nearly to their proper basis and buyers are not so timid as they were. The great pool scheme which was promised to materialize some time since, has passed out of recollection almost, and both the trade and manufacturers are to be congratulated on it. Such provisions are temporary and artificial in their character, and are sure sooner or later to face the stern and unalterable facts of competition and financial necessity, to say nothing of a certain elasticity of conscience on the part of the members, which is an uncertain factor in producing permanent results. Crops promise well, and there is no reason why a large business should not be done at figures now prevailing.

Chains for Lifting and Hauling.

An interesting paper on "The Use and Care of Chains for Lifting and Hauling" was presented by Mr. Henry Adams at a recent meeting of the British Civil and Mechanical Engineers' Society. Mr. Adams divided chains into two classes—those with oval links and those formed of flat bars or plates; the former were again subdivided into "common" and "short-linked" chains. It was pointed out that the links of the latter being well rounded, each one acts as a spring when the load surges; hence their universal adoption for lifting purposes. The dimensions of the links are, for the extreme length and breadth, four and two-thirds and three and a third times respectively the diameter of the iron of which the link is made. In repairing or joining a chain the new link has to be made a little longer, to give room for welding, as there are two others in it instead of one as in making a new chain. The various modes of welding were described and the peculiar tendency of some chains to twist while in use was pointed out. The different sheaves in use according to circumstances were shown by diagrams, the diameter in any case being not less than 30 times that of the chain iron. Speaking of the care and maintenance of chains, Mr. Adams remarked that in warehouses and large offices much damage is done by sweeping dust into the hoists, cutting the chain like emery. Coal dust is not very detrimental to chains, but coke dust is decidedly bad. Sling and fall chains used in the erection of machinery and buildings are always used dry for various reasons. They should be put through a wood fire and annealed after every large contract, or say every two years, and carefully examined by a skilled man before being taken into use again. In summarizing the points of economy in the maintenance of chains the author said that the testing should be moderate, the annealing frequent, the lubrication thorough, and when the wearing is not uniform throughout the length the chains should be cut and pieced when partially worn, so that when finally discarded each length shall have done its full share of work without overstepping the limits of safety.

The buildings of the Paterson Iron Works, which were totally destroyed by fire last week, extended over 700 feet in length, and were spread over 18 acres of ground. It will be several weeks before more than a rough guess at the loss can be made. It will take time to inspect the valuable machinery, and see what can be saved or renovated, and how much is utterly ruined. The forge department cost \$600,000, it is said; the blacksmith shop \$300,000, and the steel plate mill \$100,000. The total loss is probably from \$250,000 to \$300,000, with total insurance of \$75,000, placed in various companies, the largest single policy being for \$5000. Two hundred men were employed turning out the heaviest kind of forgings done in the country. It is believed the fire caught from sparks from one of the big steam hammers, on which a gang of men were working at the time. The works will be rebuilt.

Messrs. Lindsay, Parvin & Co., of 328 Walnut street, Philadelphia, have just published a very handsome card, giving the weights of plate iron per lineal foot, from widths from 12 to 60 inches, and thicknesses, by sixteenths of an inch, from 1/16 to 1 inch.

The directors of the Manchester Ship Canal Company have concluded to contract for the construction of the canal for \$25,000,000. The contract is conditional on the whole capital being subscribed. The directors now assert that the capital has been secured.

Another Serious Labor Trouble.

The Chicago builders are the latest acquisition to the list of employers organized to resist the encroachments of organized workmen. Operating through the Builders' and Traders' Exchange, they have effected a remarkably compact organization of the building interests of Chicago, considering the diverse character of the trades involved. The movement includes not only those engaged in the actual work of erecting and finishing houses, but also those dealing in materials. Among the lines of business represented in the Builders' and Traders' Exchange are the following: Architectural ironwork, asphalt and Portland cement paving, brickmaking, builders' hardware, electric work, fire-brick and clay, fire proofing, galvanized ironwork and cornices, glass, granite, lumber, elevators, lime and hair, mantels, grates, brass goods, paints and oils, plumbing and gas-fittings, sash door, and blind making, molding, sand and gravel, sewer pipe, steam heaters, terra cotta and wire and iron work. All have pledged themselves to stand by their fellow members in case of trouble with employees. The originators of the scheme say that it is not their purpose to build up the organization for the sake of crushing labor, but to enable a long suffering class of employers to defend themselves and to resist the increasing attempts of workmen to manage every detail of their business.

It has been the rule for some years to pay off bricklayers and stonemasons on Monday or Tuesday. This has seemed most satisfactory for a number of reasons, one of which is to secure the regular appearance of the men at their work on Monday morning, many of them having been in the habit of "going on a Saturday night spree" when they were formerly paid off on Saturday, and not turning up for work until Tuesday or Wednesday. The change of pay-day has greatly changed this condition of affairs. It has, however, never been accepted willingly by the men, and latterly they concluded to strike if pay-day was not changed back again. They believed themselves strong enough to force this concession, as they had obtained nearly everything else they had asked for. But they reckoned without their host. The carpenters' strike, the hod carriers' strike and a number of other strikes of less consequence had gradually worked the employers up to a fighting pitch, and this last strike was the straw that broke the camel's back. On the 12th inst., after a number of bricklayers and masons had quit work, the builders' association ordered all building operations to be discontinued on Friday evening, the 13th inst., and to remain so until the labor trouble was settled.

With the exception of a few buildings and other construction work which had to be pushed, or great loss would result to the contractor, all work of this character in Chicago was suspended on Saturday. Not only was it impossible to get a builder to agree to do any work, but it was equally impossible to purchase any material and have journeymen undertake the work without the intervention of a builder. At the lowest estimate over 20,000 men were thrown idle, to remain so until the workmen agreed to free the builders from the restrictions which have been forced upon them from time to time for years. It is pretty well established that the builders will insist on the non-recognition of unions, the re-establishment of the 10-hour day, the opening of Chicago to workmen from any other locality and the gradation of pay according to the ability of the men.

As to the effect of this great lock out upon business generally, it is difficult to form an estimate. All classes of building material will, of course, find no sale in Chicago for local use, as long as work is suspended. This includes builders' hardware, nails, structural iron, architectural iron, metal roofing, cornice work, &c. If the Knights of Labor are able to do what they now threaten, the results of this trouble will cover a much greater area, affect a much larger number of men, and involve many more interests. The men all unite in stating that the fight is one between capital and labor, and that the master builders are intent upon destroying the trades unions. If this is the case the trades unions will combine to strike back, and all the men employed in the building industry throughout the country will be ordered out, so that the Chicago builders may be forced to surrender. The National Boards of the Brotherhood of Carpenters and Joiners, of the Amalgamated Carpenters, of the Plumbers' National Union, and of many other building trade National unions will take up the fight and support the men either financially or by striking. It would be impossible to obtain either men or material from outside sources, for the Knights claim the Brotherhood of Locomotive Engineers and the switchmen's union would enter the fight to defend trades unions and the sailors would refuse to assist the bosses. There are in the United States 4,000,000 organized workmen, and the minority would support the strikers in case the strike involved 2,500,000 men.

Inasmuch as this sort of talk has always been indulged in recently, whenever there has been a strike of any consequence in progress, and yet no such results have happened, it is very difficult to believe that the workmen of other cities will support those of Chicago in this case. It will hardly be so important as that. But even if the movement is closely confined to Chicago, if it should last for several weeks, its effects will be serious, and will extend to business interests elsewhere.

A very curious story is reported concerning a recent sale of stock of the Ensley Land Company of Alabama. Buyers at that sale appear to have generally been under the impression that the stock of the company was \$1,000,000 and took it at 60. Later it became known that it was in reality \$10,000,000. Sharp protests followed, which caused settlements to be made at 10 cents on the dollar.

Charles L. Perkins, a well known iron merchant of the city, died in Paris on Tuesday, 17th inst., from pneumonia. He had been in fair health and his death was unexpected.

He left New York early last winter, and had been living in London and Paris since then in company with a daughter. Mr. Perkins was born in Salem, Mass. He came to New York about 35 years ago and engaged in the iron trade. His firm were for some years Perkins, Vose & Co., and subsequently Perkins, Livingston, Post & Co. About two years ago he retired from active business. He was a member of the Union and of the Knickerbocker clubs. The body will be brought on to New York for burial.

NEW PUBLICATIONS.

THIRD ANNUAL REPORT OF THE CHIEF STATE INSPECTOR OF WORKSHOPS AND FACTORIES TO THE GENERAL ASSEMBLY OF THE STATE OF OHIO FOR THE YEAR 1886

Through the courtesy of Mr. Henry Dorn, Columbus, Ohio, Chief State Inspector of Workshops and Factories, we are in receipt of the above report. The publication is a pamphlet of nearly 150 pages, mostly filled with tables giving name of firm, location, goods manufactured, employees, and condition of the workshops and factories inspected. The remarks prefatory to the tabular portion of the report occupy about 30 pages, and contain some valuable observations on the importance of State inspection of all places where people are employed at labor, besides giving some useful hints regarding the management of engines and boilers, the ventilation and heating of workshops, &c. The inspector particularly urges the rigid enforcement of the law prohibiting the employment of minors under 12 years of age in workshops and factories, so that the children may not be deprived of the benefits of a common school education. Of the good that has resulted from the system of inspection mention is made of the increased attention given to the subject of efficient fire escapes, many establishments having complied with the requests of the inspectors to provide these safety appliances to buildings. The subject of heating and ventilation is treated of in a general way. Especial stress is laid on the necessity of providing suitable guards for machinery, and the system of automatic sprinklers as a protection against fire is highly recommended. The report is interesting throughout, and testifies strongly to the advantages to be derived from the proper State inspection of workshops and factories.

Influence of Material on Design.

F. Fowke in discussing the influence of material upon design, writes as follows: The nature of the building materials in common use in different parts of the world has always exercised an important influence on the character and nature of the constructions of which they form a part, so much so as, in fact, to influence in a great degree the system and feeling of national architecture, so that we have the ponderous massiveness of Egypt, the stern grandeur of Greece, and the classic elegance of Rome—all the offspring of a hard, enduring material, more or less stubborn under the chisel and mallet. The more manageable materials in use in the middle ages, were undoubtedly instrumental in producing a change in the nature of the constructions of the period, and probably to such accidents of place and circumstance are we indebted for many of those beautiful and fantastic forms which delight us as much by their delicacy of execution as by their hardness of design, and in which the architect, adapting his work to the materials at his disposal, has atoned for his departure from the severe outline and imposing masses of Classic architecture by the introduction of a charm to which his sterner predecessors were strangers. In our own time, in newly settled countries, such as America, and many of our colonies where wood is abundant, and stone is either difficult to obtain or expensive from the scarcity of labor, we find a different kind of construction springing up, often picturesque in appearance, and exhibiting much talent in design, but especially creditable for its simplicity and ready adaptations; at the same time, its ephemeral and temporary character cannot fail to give it more or less an air of insecurity and want of strength, however unmerited. Finally, we come to that period which has with truth been called the age of iron, in which a total change of material has effected as great an alteration in the construction into which it enters, rendering simple feats of construction, which it would have been folly to have attempted in any of the previous records.

The M. C. Bullock Mfg. Company, of Chicago, have just built to order a machine for making railroad spikes, which they say successfully solves the problem of taking the bar from the rolls without reheating. The new machine makes from 90 to 100 spikes per minute, against 35 to 40 by the old method. The names of the owners and patentee are not disclosed, but plans are being prepared for the construction of a number of the machines, to be added to the equipment of a large iron and steel works. The same company are also building an eight-page perfecting printing press, which is very compact, beautifully designed, and is said to be destined to work a revolution in printing. Among other new machines for which patterns are now being made are four boring drills, Boyle ice machines and Lane hand friction drums.

Mr. Kenneth Robertson, formerly connected with the Secaucus Furnace, has accepted an engagement with the Sloss Iron and Steel Company.

Orders for freight cars continue to be placed in rather large quantities. One order for 700 was placed last week with a Chicago builder. The car-wheel makers are favored by this condition of activity, quite a number of good contracts for wheels having been made within the past two weeks.

It is reported that the Durham Iron Company has been exceptionally successful in making a high-phosphorus low silicon pig, for use in the manufacture of basic steel at Pottstown.

WHOLESALE METAL PRICES, MAY 18, 1887.

METALS.

IRON.—Duty: Bars, 8-10¢ to 11-10¢; provided that no bar shall pay a less rate of duty than 35¢. Sheet, 11-00¢ to 15-10¢. Hand, Hoop and Scrolled, 1¢ to 1-10¢. Railroad Bars weighing more than 25 lb. per yard, 7-10¢ to 1¢.

Standard American Pig Iron.

Foundry No. 1 X	ton 21.00 @ 21.50
Foundry No. 2 X	ton 20.00 @ 20.50
Gray Forge	ton 18.00 @ 19.00
No. 1 Scotch Pig Iron.	
Carnbro	ton 22.50 @ 23.50
Coltess	ton 22.00 @ 23.00
Shotts	ton 21.00 @ 22.00
Glenbrook	ton 20.50 @ 21.50
Gartshore	ton 20.00 @ 21.00
Langdon	ton 21.50 @ 22.00
Summerlee	ton 20.00 @ 21.00
Dumfries	ton 20.00 @ 21.00
Edinburgh	ton 20.00 @ 21.00
Clyde	ton 20.00 @ 21.00

Steel at Eastern mills. ton 24.00 @ 40.00
Old Rails, Ts. ton 21.50 @ 22.00

Wrought, ton from yard \$22.50 @ 23.00
Bar Iron from Store.

Common rod:
3/4 to 2 in. round and square. ton 21.00 @ 22.00
1 to 6 in. x 3/4 to 1 in. ton 21.00 @ 22.00

Refined iron:
3/4 to 2 in. round and square. ton 21.00 @ 22.00
1 to 6 in. x 3/4 to 1 in. ton 21.00 @ 22.00
Rods—3/4 and 1-1/2 round and square. ton 21.00 @ 22.00
Bands—1 to 6 in. x 3/4 to 1 in. ton 21.00 @ 22.00
"Burden's Best" iron, base price. ton 21.00 @ 22.00
Burden's "H. B. & S." iron, base price. ton 21.00 @ 22.00
Norway Rods. ton 21.00 @ 22.00

Sheet Iron from Store.

	Common	R. G.
10 to 16.	ton 21.00 @ 22.00	ton 21.00 @ 22.00
17 to 20.	ton 21.00 @ 22.00	ton 21.00 @ 22.00
21 to 24.	ton 21.00 @ 22.00	ton 21.00 @ 22.00
25 and 30.	ton 21.00 @ 22.00	ton 21.00 @ 22.00
28.	ton 21.00 @ 22.00	ton 21.00 @ 22.00

Galvanized 16 to 20. ton 21.00 @ 22.00
Galvanized 1 to 24. ton 21.00 @ 22.00
Galvanized 25 to 30. ton 21.00 @ 22.00
Galvanized 31. ton 21.00 @ 22.00
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Galvanized 96. ton 21.00 @ 22.00
Galvanized 97. ton 21.00 @ 22.00
Galvanized 98. ton 21.00 @ 22.00
Galvanized 99. ton 21.00 @ 22.00
Galvanized 100. ton 21.00 @ 22.00

Iron Wire.—(See Wire.)

STEEL.—Duty: Ingots, Bars, Sheets, &c., valued at 4¢ per lb. or less, 45¢ ad. val.; valued above 4¢ and not above 7¢ per lb., 2¢ ad. val.; valued above 7¢ and not above 10¢ per lb., 3¢ ad. val.; valued above 10¢ per lb., 4¢ ad. val. Extra—Steel Bars, Rods, 10¢ per lb. and 11-16 round and square. ton 21.00 @ 22.00
Cold hammered or polished, in any way in addition to ordinary hot rolling, 1¢ per lb. in addition to above; Steel Circular Saw Plates, 1¢ per lb. in addition to the above.

American Cast Steel.

For American Steel see Pittsburgh quotations.

Chrome Steel.

Tool Steel, ordinary sizes, 3/4 to 3 inches, net. ton 21.00 @ 22.00
Adamantine Shoes and Dies. ton 21.00 @ 22.00
Magnet Steel. ton 21.00 @ 22.00

English Steel.

Best Cast. ton 21.00 @ 22.00
Extra Cast. ton 21.00 @ 22.00
Circular Saw Plates. ton 21.00 @ 22.00
Swaged Cast. ton 21.00 @ 22.00
Best Double Shear. ton 21.00 @ 22.00
Blister, 1st quality. ton 21.00 @ 22.00
German Steel, Best. ton 21.00 @ 22.00
2d quality. ton 21.00 @ 22.00
3d quality. ton 21.00 @ 22.00
Sheet Cast Steel, 1st quality. ton 21.00 @ 22.00
2d quality. ton 21.00 @ 22.00
3d quality. ton 21.00 @ 22.00

TIN.—Duty: Plates, Sheets, Taggers and Termes, 1¢ per lb. Bars, Block and Pigs free.

Banca. ton 21.00 @ 22.00
Strait. ton 21.00 @ 22.00
English. ton 21.00 @ 22.00
Bar. ton 21.00 @ 22.00

Charcoal Tin Plates.

C 10x14 225 sheets. ton 21.00 @ 22.00
C 12x12 225 sheets. ton 21.00 @ 22.00
C 10x20 112. ton 21.00 @ 22.00
X 10x14 225 sheets. ton 21.00 @ 22.00
X 12x12 225 sheets. ton 21.00 @ 22.00
X 14x20 112. ton 21.00 @ 22.00
D C 12x12 112. ton 21.00 @ 22.00
D C 10x20 112. ton 21.00 @ 22.00
For each additional X add. 1.35 @ 2.25

Coke Tin Plates.

Best. Ordinary.
C 10x14. \$4.50 \$4.40 @ 4.50
C 14x20. 4.75 4.60 @ 4.65
C 12x12. 5.00 4.80 @ 4.85
C 10x20 gutters, 225 sheets. 5.00 4.80 @ 4.85
C 12x12 112 sheets. 9.00 @ 9.50

Terne Plates.

Prime (Char. 3d. quality. \$13.25
C 14x20 Old Process. 13.25
C 20x28. 14.50 @ 14.75 4.375
X 14x20. 5.75 @ 6.00 8.50 @ 8.70
C 20x28. 8.80 @ 9.30 8.75 @ 8.50 @ 8.70
X 20x28. 11.00 @ 12.00

Tin Boiler Plates.

1XX 14x20, 2 sheets for No. 7, 112 sheets. @ \$12.00
1XX 14x20, 2 " " No. 8. 18.00
1XX 14x20, 2 " " No. 9. 15.00

COPPER.—Duty: 1 1/2¢. Bar and Ingots, 4¢. Old Copper, 3¢. Manufactured (including all articles of which Copper is a component of chief value), 35¢ ad. valorem.

Ingots, Lake. ton 21.00 @ 22.00
Ingots, Baltimore. ton 21.00 @ 22.00
Ingots, Anchor. ton 21.00 @ 22.00

Cold Rolled Sheet.

6 oz. per square foot, and heavier. ton 21.00 @ 22.00
4 and 15 oz. per square foot. ton 21.00 @ 22.00
12 and 18 oz. per square foot. ton 21.00 @ 22.00
10 and 11 oz. per square foot. ton 21.00 @ 22.00

TINNING.

Sheets, one side, 10, 12 and 14 x 48. each, 8¢
Sheets, one side, other sizes. 7¢ square foot 2¢
For tinning both sides, double the above prices.
For tinning boiler sizes, 9 in. x 14 x 63. each, 15¢
For tinning boiler sizes, 8 in. x 14 x 56. each, 12¢
For tinning boiler sizes, 7 in. x 14 x 52. each, 12¢

Sheathing Copper. (14 x 48.)

Hot Cold.
14 oz. to sq. ft. and heavier, per lb. 1¢ 1/2¢
14 oz. and up to 16 oz., per lb. 1¢ 2/3¢
2 oz. and up to 14 oz., per lb. 30¢ 21¢
Tinning, 6 cents each.

Copper Bottoms.

Pits and Flats, 14 oz. ton 21.00 @ 22.00
Pits and Flats, 12 oz. ton 21.00 @ 22.00

O'Neill's Patent Platinized Copper.—Net.

14 and 16 oz. and heavier 3¢. By the case, 1¢ 2/3¢
12 oz. and lighter 3¢. 21¢

Boiler Sizes.

7 in. 14 x 70. 9 in. 14 x 60.
and 16 oz. and heavier 3¢. By the case, 1¢ 2/3¢
and all sizes not over 30 in. wide.
14 x 48 and 30 x 60.
and 16 oz. and heavier. ton 21.00 @ 22.00
Platinized Brass same price as Platinized Copper

Copper Wire.—(See Wire.)

Shrinking Metal.

Yellow Sheathing Metal. ton 21.00 @ 22.00

BRASS AND GERMAN SILVER.

rows & Sharps's Gauge the Standard for Metal;
Old English Gauge the Standard for Wire.
Base Manufacturers' Price List, January 17,
1887. ton 21.00 @ 22.00

LEAD.—Duty: Pig, 3¢ per 100 lb.; Old Lead, 2¢ per 100 lb.; Pipe and Sheet, 3¢ per 100 lb.

Pig.	ton 21.00 @ 22.00
Bar.	ton 21.00 @ 22.00
Pipe.	ton 21.00 @ 22.00
Block Tin Pipe.	ton 21.00 @ 22.00
Tin Lined Pipe.	ton 21.00 @ 22.00
Sheet.	ton 21.00 @ 22.00
Shot.	ton 21.00 @ 22.00
Chilled Shot.	ton 21.00 @ 22.00

ANTIMONY.

Hallet's. ton 21.00 @ 22.00
Cookson. ton 21.00 @ 22.00

SPELTER.—Duty: Pigs, Bars and Plates, \$1.50 per 100 lbs.

American cash. ton 21.00 @ 22.00
Bergenport. ton 21.00 @ 22.00

ZINC.—Duty: Pig or Block, \$1.50 per 100 lbs.

Sheet. 2 1/2¢ per lb.
600 lb. casks. ton 21.00 @ 22.00
Zinc—Open. ton 21.00 @ 22.00
Zinc Tubing. ton 21.00 @ 22.00

Plain.

Fancy. ton 21.00 @ 22.00
Scotch and Extra Patterns. ton 21.00 @ 22.00

RABBIT METAL.

N. P. U. ton 21.00 @ 22.00
X. X. ton 21.00 @ 22.00
J. H. ton 21.00 @ 22.00

WIRE.

Market Wire.—Put up in 6 lb. bundles.
Nos. 00 to 9, 10, 11, 12, 13, 14, 15, 16, 17, 18.

10 11 11 1/2 12 1/2 13 1/2 14 1/2 15 1/2 16 1/2 17 1/2 18 1/2

Bright Market Wire. ton 21.00 @ 22.00
Charcoal. ton 21.00 @ 22.00
Bale Wire. Nos. 7 to 12. ton 21.00 @ 22.00
Annealed Market Wire. ton 21.00 @ 22.00
Fence Wire. Nos. 10 to 14. ton 21.00 @ 22.00
Coppered Market Wire. ton 21.00 @ 22.00
Bale Wire. Nos. 7 to 12. ton 21.00 @ 22.00
Galvanized Market Wire. ton 21.00 @ 22.00
Fence Wire. ton 21.00 @ 22.00

Stone or Weaving Wire.

Nos. 16 17 18 19 20 21 22 23 24 25 26
Cents. 14 15 16 17 18 19 20 21 22 23 24 25 26
Nos. 27 28 29 30 31 32 33 34 35 36
Cents. 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Steel Wire.

Cast Steel, Steel Wire List. ton 21.00 @ 22.00
Old English Gauge the Standard.—Dis. 20 @ 25.

Brass and Copper Wire.

Common High Low
Brass Brass Brass
Copper. ton 21.00 @ 22.00

All Nos. to No. 16. \$0.22 \$0.26 \$0.30
Inclusive. ton 21.00 @ 22.00
No. 17 and 18. ton 21.00 @ 22.00
" 19 and 20. ton 21.00 @ 22.00
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" 22. ton 21.00 @ 22.00
" 23. ton 21.00 @ 22.00
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" 96. ton 21.00 @ 22.00
" 97. ton 21.00 @ 22.00
" 98. ton 21.00 @ 22.00
" 99. ton 21.00 @ 22.00
" 100. ton 21.00 @ 22.00

MISCELLANEOUS TINNERS' STOCK.

1¢ & 1/2¢ Warranted. ton 21.00 @ 22.00
Extra. ton 21.00 @ 22.00
No. 1 Refined. ton 21.00 @ 22.00
No. 2 Refined. ton 21.00 @ 22.00
Extra wiping. ton 21.00 @ 22.00

Rivets.

Iron and Tinned, new list, Dec. 10, 1881. ton 21.00 @ 22.00
In bulk, new list, Dec. 10, 1881. ton 21.00 @ 22.00
Copper Rivets and Burrs. ton 21.00 @ 22.00
Nos. 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

STOVE BOLTS.

American Screw Co.'s. ton 21.00 @ 22.00
R. B. & W. ton 21.00 @ 22.00
R. & E. Mfg. Co. ton 21.00 @ 22.00

FRENCH GLASS.

January 27, 1885. Per Box, 50 feet

Single Thick.

Sizes. 1st. 2d. 3d. 4th.

25 6 x 8 to 10 x 15. \$10.50 \$9.00 \$8.50 \$8.00
40 11 x 14 to 16 x 24. 11.50 10.75 10.25 9.75
50 18 x 22 to 20 x 30. 15.50 14.50 14.00 13.50
60 15 x 36 to 24 x 30. 16.50 15.00 14.50 14.00
70 28 x 36 to 24 x 36. 17.75 16.25 15.75 15.25
80 36 x 48 to 30 x 50. 21.00 19.50 19.00 18.50
90 30 x 52 to 24 x 54. 22.00 20.50 20.00 19.50
100 30 x 56 to 24 x 56. 23.00 21.50 21.00 20.50
110 34 x 58 to 24 x 60. 24.00 22.50 22.00 21.50
120 36 x 60 to 24 x

(Concluded from page 1.)

that the pumps make 25 double strokes per minute. The theoretical capacity of each pump is about 550 gallons per minute. Outside of the three large engines, there is a little 2-horse-engine of the same make. It drives by a belt the shafts *a a*, Fig. 3, at a speed of 200 turns per minute. The shafts *a a* drive by belt the shafts *o o o*, which are connected by gearing and make 120 turns per minute. These shafts start the large engines till the first charge has been drawn in and exploded, when by a ratchet and pawl arrangement they are automatically thrown out of gear. The little gas engine is also used for driving two pumps, one for supplying air to the air chamber, and the other for supplying water to the tank in vestibule to cool the engines. The air chamber, which, together with the gasometers and the pressure governors, stands in a vestibule, is made of wrought iron, and is 5 feet in diameter by 15 feet high. The gas is supplied to the pumping engines by a 5-inch main. The contract with the Otto Gas Engine Works, at Deutz, called for a gas consumption of not more than 28 feet per actual horsepower. The trials made at the factory gave a far better result, though the gas used there was far below 14 candle-power (the quality of the gas stipulated for). The water pumped was expected to represent as much as 80 per cent. of the horse power of the engines. The price of water charged the public has been 16 cents per 1000 gallons, no charge being made for introducing the water to the houses of the citizens. Up to now only 10 miles of main have been laid down.

Messrs. Schleicher, Schumm & Co. have informed us that the engines and pumps have since been officially tested as to gas consumption and water delivery, and that the results considerably exceeded the figures guaranteed.

The Inspection of Bridges and the Strength of Materials.

Mr. James E. Howard, engineer of tests at the Watertown Arsenal, has written the following letter to the Boston Herald:

The text of the bill recently submitted by the chairman of the railroad commissioners to the committee on railroads of the Massachusetts Legislature presents a matter likely to meet with general commendation in its effort to obtain legislation for the greater security of the traveling public, by means of periodic inspection, under State supervision, of all the railway bridges of the commonwealth. Of course it will not be supposed that heretofore nothing of the kind has been done, but the work is of such magnitude that inspections of the past can hardly have been otherwise than cursorily done. The inspection of a bridge or other complex structure presents many difficulties, and to be of full value and reveal the true status of affairs it is a more laborious task than generally supposed by persons outside of the engineering profession. It does not consist merely in loading the structure beyond the weight of the heaviest train, but a careful examination of all its details. To do this work conscientiously and well the position of an inspector will be no sinecure, and it can only be successful with the aid of engineering and metallurgical skill of a high order. The steps necessary to be taken in order to examine the superstructure of a bridge consists in ascertaining the maximum and minimum stresses which may come upon each member, assuming the workmanship to be good. This data will be obtained by computation, and from a mathematical standpoint there is little ambiguity as to what the stresses will be in the different parts of well-designed trusses. Having made this computation, it may be said the trouble now begins. Knowing the stresses which each member should bear it must be found out in some style of trusses whether the disposition of material and quality of workmanship enable such a disposition of loads to be effected, and where imperfections exist, learn of their extent. Finally, the most difficult part of the task is reached when we undertake to learn of the quality of the material, and whether it is capable of sustaining the imposed loads, not only for the present, but whether there is liability to deterioration which will detract from its durability and ultimate safety. As to the mathematical parts of the problem, engineers are in accord, generally speaking; hence this part of the subject will not be dwelt upon. Questions relating to the strength and durability of metals cannot be answered with the same degree of precision.

The subject of the strength of materials is a complex one in its different bearings, and our knowledge is derived from the combined experience of practical men, who for years have been close observers of the behavior of metals under the actual conditions of practice; also from the results of numerous special experiments, which have been executed for the direct purpose of following up different lines of investigation. Information derived in this last manner is of the most trustworthy character; whereas, in actual railroad practice, facts may be observed which involve several unknown elements, to eliminate which years may elapse before the opportunity arrives. In the case of special experiments, by investigating one unknown element at a time the correct solution of the problem is soon reached. There are cases, however, in which the element of time itself is the unknown factor, and the experiment of necessity extends over a long period. Work of this character, both scientific and practical, as regards the immediate value of the tests, has now been going on with the United States testing machine of 800,000 pounds capacity, at the Watertown arsenal, for over seven years, during which time there has been tested to destruction constructive material to the extent of over 320,000 pounds weight, and of which railway material has formed an important part. A perusal of the annual reports of these tests, a congressional document for public distribution, will show that extensive tests have been made with full-sized bridge columns, with tension members, riveted joints and other details of construction. These numerous tests have established many important facts, and ruthlessly destroyed fallacious theories.

Inasmuch as it is usually quite an easy matter to criticize existing affairs in a general way without adding material to the common stock of knowledge, it may be desirable to change the programme and direct our attention chiefly to facts, and those features which bear directly upon the intelligent use of constructive material. In the tensile test of iron and steel we have its modulus of elasticity, elastic limit, tensile strength, elongation, contraction of area at point of

double the elastic stretch. It is found, however, that when a piece of iron or steel is stretched beyond the elastic limit, and a "permanent set," so called, given the metal, a disturbance is caused in the modulus of elasticity, temporary, however, and from which the metal recovers within a few days. While this disturbance exists the elastic elongation increases more rapidly than the loads increase. This fact is suggestive of fatigue or of some loss of cohesion in the

are erected although some of the members may have been in the process of manufacture, the effects of heat will not be discussed. In case a load of tension is applied exceeding the "natural" or primitive elastic limit a new elastic limit is formed equal to and sometimes exceeding that load. In this manner a new elastic limit may be formed anywhere up to nearly the tensile strength. It will be seen from this how little importance can be attached to the elastic limit unless it is known how it was formed, and when an engineer says the working stresses should never exceed the elastic limit, and does not define that limit, taken strictly, that only means that the tensile strength shall not be exceeded, which must be obvious to any one.

This brings up for consideration an interesting point in regard to the hangers used in the Bussey Bridge, to the eccentricity of which was attributed their failure, notwithstanding the fact that an actual test of the only remaining hanger showed a tensile strength several times the load estimated to have come upon it in the bridge and the refusal of a new eccentric hanger to break in the eccentric part. No doubt the primitive elastic limit on account of eccentricity of load is soon reached, but then a new elastic limit would be formed and continue to be elevated as the weight of trains was increased. The question is, Which elastic limit, if any, had anything to do with the ultimate failure? The resemblance of the failure of the hangers to the grooving of steam boiler plates suggests another explanation. An illustration presenting an ethical case of elevation of elastic limit is found in piano wire, which is strained probably beyond even the tensile strength of the annealed wire, remains in this state for years, and whose entire business is to vibrate. Passing on to the tensile strength of a metal, this is the load which once applied, and gradually increased, produces rupture. This property is influenced by previous mechanical treatment, and generally speaking, the same treatment which causes an elevation of elastic limit also causes an elevation in tensile strength. In this way bars which were tested to rupture at the Watertown arsenal four years ago, and gave a tensile strength of 52,000 pounds per square inch, now a retest of the fractured ends show a tensile strength of about 62,000 to 64,000 pounds per square inch. This feature led the late Sir William Siemens to remark of the mild steel made by his process that any so-called

tive elastic limit comes into use to assist in correcting imperfect mechanical adjustments of parts of structures. Contraction of area occurs locally after the maximum load has been passed, and marks the place where rupture occurs, the character of the broken surface showing fibrous or silky in ductile iron and steel and granular in brittle metal.

The quality of a metal is judged by the physical properties above described, and there is a wide range of properties over which an inspector has to pass judgment when the material is accessible for test. In a bridge but little can be done; the parts are generally so well painted that they are nearly or quite invisible, and, even if exposed to view, the quality of the metal could not be thereby ascertained. If the loads in the bridge exceed the primitive elastic limit, it may be ascertained by the surface scale (magnetic oxide) starting off, as this scale will start off at that time. There is no known method of determining whether a bar is ductile or brittle except by testing it and developing these qualities, and this, of course, unites it for use. Out of a lot of metal made from one grade of stock in the wrought iron or out of the same heat in a lot of steel, we have reasonable assurance that there will be uniformity within certain limits; therefore it is possible in new work to provide suitable metal from a comparatively small number of tests. But in the case of old material uncertainty exists as to the quality of the metal. As to the earlier methods of manufacture, we are unpleasantly certain a great many welds were used, and some of them may be, and doubtless are, imperfect. It is a very good weld that will sustain 80 per cent. of the strength of the solid bar. Most blacksmiths entertain exaggerated notions of their ability to weld iron, the opportunity of witnessing their work tested would dispel the illusion.

Experiments upon the effect of suddenly applied loads have shown that tough metal is not thereby rendered brittle. Colonel Maitland, of the English army, cites his experiments which were made for the purpose of developing brittleness by suddenness of fracture. The material which was employed gave an elongation in the testing machine of 35 per cent. When ruptured by a falling weight the elongation was increased. Thinking that was not rupturing the specimen quick enough, he employed gunpowder with the same result as before; he then used dynamite, and finally gun cotton, when the elongation of the specimen actually rose to about 68 per cent. It is needless to remark what his conclusions were. Other experiments which have been made with falling weights striking upon flat plates showed that both strength and toughness were retained by the metal, as also did similar tests with cartridges of gunpowder and dynamite exploded against plates.

A source of danger when steel is employed for bridges and other uses is the presence of initial strains which may be in

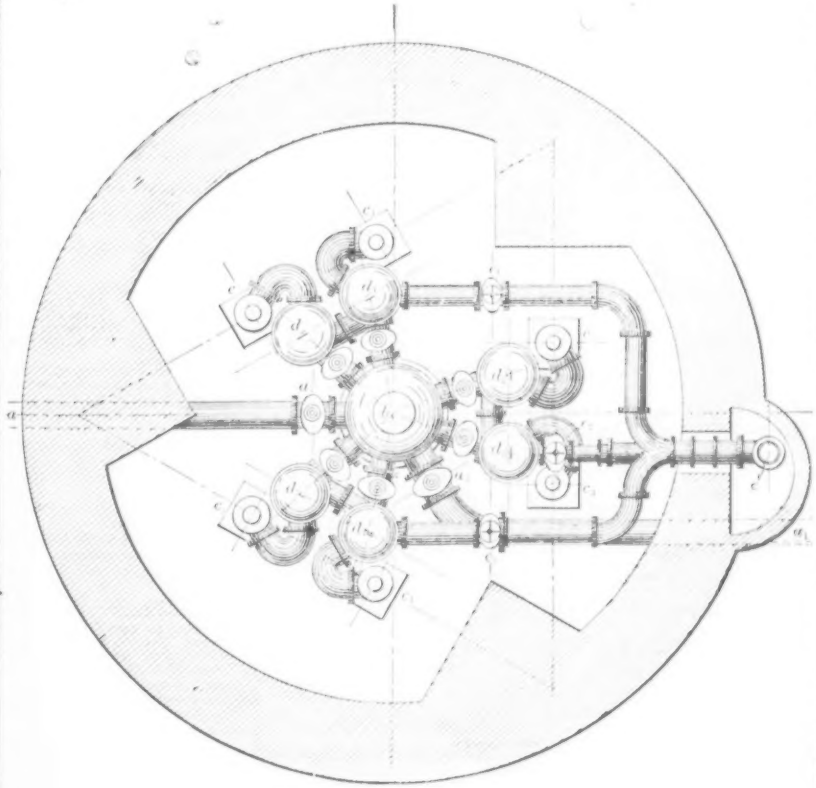


Fig. 2.—Plan of Pump Pit.

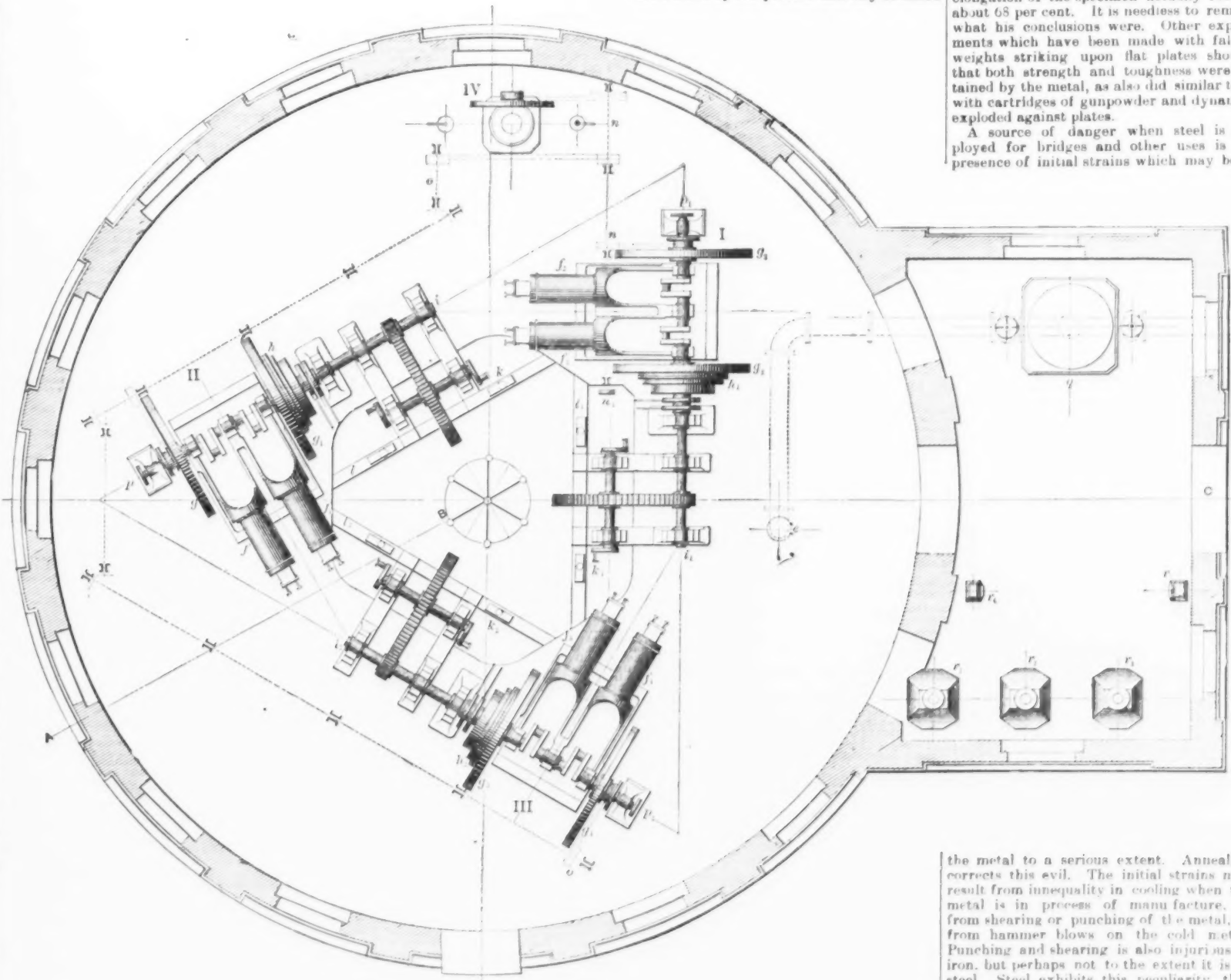


Fig. 3.—Plan.

WATER WORKS AT COBLENZ, GERMANY, DRIVEN BY OTTO GAS ENGINES.

rupture, and character of broken surface. Each of these are useful features to know. Temporary magnetism is more or less strongly excited and the polarity of the fractured specimens enable their relative positions in the testing machine to be identified. Efforts which have been made to judge of the physical properties of metals from magnetic observations have thus far been unsuccessful.

The modulus of elasticity is a measure of the elasticity of the material within its elastic limit, and indicates the amount of extension or compression under given loads, and which the material entirely recovers from when the loads are released. Thus a piece of mild steel will elongate about one-thousandth of its length, when loaded to its elastic limit, and recover that amount when the load is removed. The amount of this elasticity displayed is in direct proportion to the load applied. Double the load produces

metal, but anything said about this peculiar behavior beyond noting the above facts is conjectural. It is necessary to consider somewhat at length these rather abstruse parts of the problem in order to show what does or does not appear to influence the durability of our iron and steel structures. In regard to the elastic limit, this may be found to range, say, from 30 per cent. of the tensile strength of the metal up to nearly its tensile strength, according to the previous manipulation of the metal or the influence of its chemical composition. Some steel-makers call the "natural" elastic limit that which results from finishing the metal at a red heat and allowing it to cool in the open air. The "natural" elastic limit may be elevated by cold stretching, cold rolling, cold hammering or wire drawing. Steel is hardened by sudden cooling from a high temperature, but as bridges are not subjected to this kind of treatment after they

maltreatment to which that metal was subjected only led to increasing its strength. It is an important piece of evidence now wanting that will show, if such is the case, when a change occurs in the cohesion of the metal and this force ceases to increase, turns about and diminishes. Until this is clearly demonstrated, and while there are other reasonable explanations why metals fail, we may be excused from undue anxiety on the subject of deterioration of metals as commonly understood. Elongation is displayed by the metal between the load at the elastic limit and tensile strength, its maximum amount ranging from less than 1 per cent in hard steels and cast iron to above 30 per cent in mild steel and soft grades of wrought iron. Treatment which elevates the elastic limit and tensile strength detracts from its power of elongation. No doubt in many instances the ability to elongate or compress under loads exceeding the primi-

the metal to a serious extent. Annealing corrects this evil. The initial strains may result from inequality in cooling when the metal is in process of manufacture, or from shearing or punching of the metal, or from hammer blows on the cold metal. Punching and shearing is also injurious to iron, but perhaps not to the extent it is in steel. Steel exhibits this peculiarity, that when sheared or punched the scale in that vicinity starts off in lines, which extend out in the solid metal, which seems to indicate that lines of strains sharply defined may penetrate the steel and not distribute themselves over much surface. May not these lines of strain reach sufficient intensity to cause that brittleness of fracture which at times occurs so unaccountably? Sharp corners should be avoided; also nicks in the edges of steel bars.

A tough and fibrous metal when nicked around the outside will break short and brittle. Now, suppose a nick was inside the bar, if it were possible to get one there, doubtless brittleness would result. A near approach to an interior nick is found in the case of a blow hole in the steel which has not in the process of manufacture been flattened out in the direction of the line of pull. This causes brittleness in fracture, and, as most steel rails are reported to fracture, when they do at all, in the first few months of their service, it is very probable that interior defects of this nature and initial strains are the causes. Certainly, if it were deterioration in quality from use, fractures would be more frequent, instead of less, as time elapsed.

WHOLESALE METAL PRICES, MAY 18, 1887.

METALS.

IRON.—Duty: Bars, 8-10¢ to 11-10¢ per lb.; provided that no bar shall pay a less rate of duty than 35¢. Sheet, 11-0¢ to 15-10¢ per lb. Band, Hoop and Rod, 1¢ to 4-10¢ per lb. Railroad Bars weighing more than 25 lb. per yard, 7-10¢ to 1¢ per lb.

Standard American Pig Iron.

Foundry No. 1 X	ton	\$21.00 @ 21.50
Foundry No. 2 X	ton	19.50 @ 20.50
Gray Forge	ton	18.00 @ 19.00
No. 1 Scotch Pig Iron.		
Carnegie	ton	\$21.50 @ 22.75
Cottrell	ton	22.00 @ 23.50
Shotts	ton	21.75 @ 22.00
Glenbrook	ton	21.25 @ 21.50
Gartshore	ton	21.00 @ 21.50
Lanark	ton	21.50 @ 22.00
Summerlee	ton	20.00 @ 21.00
Edinburgh	ton	20.00 @ 20.50
Clyde	ton	20.00 @ 20.50

Steel at Eastern mills: ton \$38.00 @ 40.00
Old Mills, Pa.: ton \$21.50 @ 22.00

Wrought, ton from yard \$22.50 @ 23.00
Bar Iron from Store.

Common rod:
3/4 to 2 in. round and square: ton \$20.00 @ 21.00
1 to 6 in. x 3/4 to 1 in. square: ton \$21.00 @ 22.00

Refined iron:
3/4 to 2 in. round and square: ton \$24.00 @ 25.00
1 to 6 in. x 3/4 to 1 in. square: ton \$25.00 @ 26.00

Rods—3/4 and 1-1/2 round and square: ton \$25.00 @ 26.00
Rods—1 to 6 in. round and square: ton \$26.00 @ 27.00

Burden's Best: Iron, base price \$3.50 @ 3.75
Burden's "H. B. & S." Iron, base price \$3.75 @ 4.00

Norway Rods: ton \$3.00 @ 3.25

Sheet Iron from Store.

Common. R. G. Cleaned.

10 to 16: ton \$2.85 @ 3.15
17 to 20: ton \$2.95 @ 3.25
21 to 24: ton \$3.05 @ 3.35
25 to 28: ton \$3.15 @ 3.45

Galvanized 16 to 20: ton \$4.00 @ 4.25
Galvanized 21 to 24: ton \$4.25 @ 4.50
Galvanized 25 to 28: ton \$4.50 @ 4.75

American Russia: ton \$5.00 @ 5.25
Russia: ton \$5.25 @ 5.50
American Cold Rolled B. B.: ton \$5.50 @ 5.75

Iron Wire.—(See Wire.)

STEEL.—Duty: Ingots, Bars, Sheets, &c., valued at 4¢ per lb. or less, 45¢ ad. val.; valued above 4¢ and not above 7¢ per lb., 25¢ ad. val.; valued above 7¢ and not above 10¢ per lb., 35¢ ad. val.; valued above 10¢ per lb., 45¢ ad. val. Cold rolled, in any way in addition to ordinary hot rolling, 15¢ ad. val. in addition to above; Steel Circular Saw Plates, 1¢ per lb. in addition to the above.

American Cast Steel.

For American Steel see Pittsburgh quotations.

Chrome Steel.

Tool Steel, ordinary sizes, 3/4 to 3 inches, net: ton \$10.00 @ 11.00
Admiralty Steel and Dies: ton \$11.00 @ 12.00
Magnet Steel: ton \$12.00 @ 13.00

English Steel.

Best Cast: ton \$14.00 @ 15.00
Extra Cast: ton \$15.00 @ 16.00
Circular Saw Plates: ton \$16.00 @ 17.00
Swaged Cast: ton \$17.00 @ 18.00
Best Double Steel: ton \$18.00 @ 19.00
Blister, 1st quality: ton \$19.00 @ 20.00
German Steel, Best: ton \$20.00 @ 21.00
3d quality: ton \$21.00 @ 22.00
Sheet Cast Steel, 1st quality: ton \$22.00 @ 23.00
3d quality: ton \$23.00 @ 24.00
3d quality: ton \$24.00 @ 25.00

TIN.—Duty: Plates, Sheets, Tagger and Term, 1¢ per lb. Bars, Block and Pig free.

Banco: ton \$24.00 @ 25.00
Strait: ton \$25.00 @ 26.00
English: ton \$26.00 @ 27.00
Bar: ton \$27.00 @ 28.00

Charcoal Tin Plates.

C 10x14 225 sheets: ton \$5.00 @ 5.75
C 12x14 225 sheets: ton 5.00 @ 5.75
C 10x20 112: ton 10.25 @ 11.75
C 10x14 225 sheets: ton 6.00 @ 6.75
C 12x14 225 sheets: ton 6.00 @ 6.75
C 14x20 112: ton 6.00 @ 6.75
C 12x14 225 sheets: ton 6.00 @ 6.75
C 14x20 112: ton 6.00 @ 6.75
For each additional X add: 1.25 @ 2.25

Coke Tin Plates.

Best. Ordinary.

C 10x14: ton \$4.50 @ 4.80
C 14x20: ton 4.75 @ 5.00
C 10x20 112: ton 9.00 @ 9.50

Terne Plates.

Prime Char. 3d. quality: ton \$13.25 @ 14.25
C 14x20 H.F. \$6.50: ton 6.50 @ 7.50
C 20x28: ton 13.25 @ 14.25
C 14x20: ton 4.50 @ 4.75
C 20x28: ton 8.75 @ 9.00
C 20x28: ton 11.00 @ 12.00

Tin Boiler Plates.

1XX 14x20, 2 sheets for No. 7, 112 sheets: ton \$12.00 @ 13.00
1XX 14x20, 2: ton 12.00 @ 13.00
1XX 14x20, 2: ton 12.00 @ 13.00

COPPER.—Duty: 1 1/2¢ Bar and Ingot, 4¢ Old Copper, 3¢ Manufactured (including all articles of which Copper is a component of chief value), 35¢ ad valorem.

Ingot, Lake: ton \$10.00 @ 11.00
Ingot, Baltimore: ton 10.00 @ 11.00
Ingot Anchor: ton 10.00 @ 11.00

Cold Rolled Sheet.

6 oz. per square foot, and heavier: ton \$12.00 @ 13.00
14 oz. and up to 16 oz. per square foot: ton 12.00 @ 13.00
12 and 13 oz. per square foot: ton 12.00 @ 13.00
10 and 11 oz. per square foot: ton 12.00 @ 13.00

TINNING.

Sheets, one side, 10, 12 and 14 x 48: each, 8¢
Sheets, one side, other sizes: each, 25¢
For tinning both sides, double the above prices.
For tinning boiler sizes, 9 in., 14 x 60: each, 15¢
For tinning boiler sizes, 8 in., 14 x 56: each, 12¢
For tinning boiler sizes, 7 in., 14 x 52: each, 12¢

Sheathing Copper. (14 x 48).

Hot. Cold. Rolled. Rolled.

16 oz. to sq. ft. and heavier, per lb.: 1¢ @ 1.5¢
14 oz. and up to 16 oz., per lb.: 1¢ @ 1.5¢
12 oz. and up to 14 oz., per lb.: 1¢ @ 1.5¢
Tinning, 6 cents each.

Copper Bottoms.

Pits and Flats, 14 oz.: ton \$21.00 @ 22.00
Pits and Flats, 12 oz.: ton 21.00 @ 22.00
O'Neill's Patent Platinized Copper-Net: ton 21.00 @ 22.00

14 and 16 oz. and heavier 3¢ By the case: ton \$20.00 @ 21.00
12 oz. and lighter: ton 20.00 @ 21.00

Boiler Sizes.

7 in., 14x52: ton \$12.00 @ 13.00
14 and 16 oz. and heavier 2¢ By the case: ton \$20.00 @ 21.00
And all sizes not over 30 in. wide: ton 20.00 @ 21.00

16 oz. and heavier: ton \$21.00 @ 22.00
Platinized Brass same price as Platinized Copper

Copper Wire.—(See Wire.)

Sheathing Metal.

Yellow Sheathing Metal: ton \$18.00 @ 19.00

BRASS AND GERMAN SILVER.

Room & Sharpe's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.

Manufacturers' Price List, January 17, 1887: ton \$18.00 @ 19.00

LEAD.—Duty: Pig, 3¢ per 100 lb.; Old Lead, 3¢ per 100 lb.; Pipe and Sheet, 3¢ per 100 lb.

Pig: ton \$4.00 @ 4.50
Bar: ton 4.00 @ 4.50
Pipe: ton 4.00 @ 4.50
Block Tin Pipe: ton 4.00 @ 4.50
Tin Lined Pipe: ton 4.00 @ 4.50
Sheet: ton 4.00 @ 4.50
Shot: 70 bag, 25 lb.: Drop, \$1.40; Buck, \$1.65
Chilled Shot: 70 bag, 25 lb.: \$1.65

ANTIMONY.

Halet's: ton \$9.00 @ 9.50
Cookson: ton 9.00 @ 9.50

SPELLER.—Duty: Pigs, Bars and Plates, \$1.50 per 100 lb.

American, cash: ton \$4.00 @ 4.50
Bergensport: ton 4.00 @ 4.50

ZINC.—Duty: Pig or Block, \$1.50 per 100 lb.

Sheet: 24¢ per lb.
Zinc—Open: ton \$1.00 @ 1.10
Zinc Tubing: ton \$1.00 @ 1.10

Zinc Tubing.—Dis. 25¢.

Plain: ton \$1.00 @ 1.10
Fancy: ton 1.00 @ 1.10
Scotch and Extra Patterns: ton 1.00 @ 1.10

SABBITT METAL.

N. P. U.: ton \$1.00 @ 1.10
X. X.: ton 1.00 @ 1.10
J. B.: ton 1.00 @ 1.10

WIRE.

Market Wire.—Put up in 60 lb. bundles.

Nos. 00 to 9, 10, 11, 12, 13, 14, 15, 16, 17, 18.

10 11 11 1/2 12 13 14 15 16

Bright Market Wire: ton \$1.00 @ 1.10
Charcoal: ton 1.00 @ 1.10
Bale Wire, Nos. 7 to 12: ton 1.00 @ 1.10
Annealed Market Wire: ton 1.00 @ 1.10
Fence Wire, Nos. 8 and 9: ton 1.00 @ 1.10
Grape Wire, Nos. 10 to 14: ton 1.00 @ 1.10
Coppered Market Wire: ton 1.00 @ 1.10
Bale Wire, Nos. 7 to 12: ton 1.00 @ 1.10
Galvanized Market Wire: ton 1.00 @ 1.10
Fence Wire: ton 1.00 @ 1.10

Stone or Weaving Wire.

Nos. 16 17 18 19 20 21 22 23 24 25 26

Nos. 27 28 29 30 31 32 33 34 35 36

Nos. 37 38 39 40 41 42 43 44 45 46

Nos. 47 48 49 50 51 52 53 54 55 56

Nos. 57 58 59 60 61 62 63 64 65 66

Nos. 67 68 69 70 71 72 73 74 75 76

Nos. 77 78 79 80 81 82 83 84 85 86

Nos. 87 88 89 90 91 92 93 94 95 96

Nos. 97 98 99 100 101 102 103 104 105 106

Nos. 107 108 109 110 111 112 113 114 115 116

Nos. 117 118 119 120 121 122 123 124 125 126

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Nos. 417 418 419 420 421 422 423 424 425 426

Nos. 427 428 429 430 431 432 433 434 435 436

Nos. 437 438 439 440 441 442 443 444 445 446

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Nos. 587 588 589 590 591 592 593 594 595 596

Nos. 597 598 599 600 601 602 603 604 605 606

Nos. 607 608 609 610 611 612 613 614 615 616

PAINTS, OILS, &c.

Paints.

Black, Lamp—Coach Painters: ton \$22.00 @ 24.00
Ordinary: ton 22.00 @ 24.00
Black Ivory Drop: ton 22.00 @ 24.00

Black Paint, in oil: Regl. 8¢; assorted cans, 11¢
Blue, Prussian, fair to best: ton 40 @ 55¢
Blue, Prussian, fair to best: ton 40 @ 55¢

Chinese dry: ton 20 @ 25¢
Ultramarine: ton 18 @ 20¢
Brown, Spanish: ton 14 @ 15¢
Van Dyke: ton 10 @ 12¢
Dyers' Patent American: assorted cans, 9¢; Regl. 7¢
Green Chrome: ton 15 @ 18¢
Paris: in oil: good, 30¢; best, 35¢
Iron Paint, Bright Red: ton 20 @ 25¢
Brown: ton 14 @ 15¢
Ground in oil, Bright Red: ton 18 @ 20¢
Purple: ton 18 @ 20¢

Litharge: ton 18 @ 20¢
Mineral Paints: ton 18 @ 20¢
Orange Mineral: ton 18 @ 20¢
Red Lead American: ton 18 @ 20¢
Venetian (Eng.) dry: ton 18 @ 20¢
Indian Dry: ton 18 @ 20¢
Sienna, American Raw, powdered: ton 18 @ 20¢
Burnt, powdered: ton 18 @ 20¢
Raw: ton 18 @ 20¢
Umber, Burnt, powdered: ton 18 @ 20¢
Raw: ton 18 @ 20¢
Vermilion, Chinese: ton 18 @ 20¢
White Lead, American, pure dry: ton 18 @ 20¢
White Paris, English Prime: ton 18 @ 20¢
Yellow Ochre, French: ton 18 @ 20¢
Purple: ton 18 @ 20¢
Vermilion: ton 18 @ 20¢
Yellow Chrome: ton 18 @ 20¢
Zinc White, American No. 1, dry: ton 18 @ 20¢
No. 1, in oil: ton 18 @ 20¢
French Paris: ton 18 @ 20¢
In oil: ton 18 @ 20¢

(Concluded from page 1.)

that the pumps make 25 double strokes per minute. The theoretical capacity of each pump is about 550 gallons per minute. Outside of the three large engines, there is a little 2-horse-engine of the same make. It drives by a belt the shafts *n n*, Fig. 3, at a speed of 200 turns per minute. The shafts *n n* drive by belt the shafts *o o o*, which are connected by gearing and make 120 turns per minute. These shafts start the large engines till the first charge has been drawn in and exploded, when by a ratchet and pawl arrangement they are automatically thrown out of gear. The little gas engine is also used for driving two pumps, one for supplying air to the air chamber, and the other for supplying water to the tank in vestibule to cool the engines. The air chamber, which, together with the gasometers and the pressure governors, stands in a vestibule, is made of wrought iron, and is 5 feet in diameter by 15 feet high. The gas is supplied to the pumping engines by a 5-inch main. The contract with the Otto Gas Engine Works, at Deutz, called for a gas consumption of not more than 28 feet per actual horse-power. The trials made at the factory gave a far better result, though the gas used there was far below 14 candle-power (the quality of the gas stipulated for). The water pumped was expected to represent as much as 80 per cent. of the horse power of the engines. The price of water charged the public has been 16 cents per 1000 gallons, no charge being made for introducing the water to the houses of the citizens. Up to now only 10 miles of main have been laid down.

Messrs. Schleicher, Schumm & Co. have informed us that the engines and pumps have since been officially tested as to gas consumption and water delivery, and that the results considerably exceeded the figures guaranteed.

The Inspection of Bridges and the Strength of Materials.

Mr. James E. Howard, engineer of tests at the Watertown Arsenal, has written the following letter to the Boston Herald:

The text of the bill recently submitted by the chairman of the railroad commissioners to the committee on railroads of the Massachusetts Legislature presents a matter likely to meet with general commendation in its effort to obtain legislation for the greater security of the traveling public, by means of periodic inspection, under State supervision, of all the railway bridges of the commonwealth. Of course it will not be supposed that heretofore nothing of the kind has been done, but the work is of such magnitude that inspections of the past can hardly have been otherwise than cursorily done. The inspection of a bridge or other complex structure presents many difficulties, and to be of full value and reveal the true status of affairs it is a more laborious task than generally supposed by persons outside of the engineering profession. It does not consist merely in loading the structure beyond the weight of the heaviest train, but a careful examination of all its details. To do this work conscientiously and well the position of an inspector will be no sinecure, and it can only be successful with the aid of engineering and metallurgical skill of a high order. The steps necessary to be taken in order to examine the superstructure of a bridge consists in ascertaining the maximum and minimum stresses which may come upon each member, assuming the workmanship to be good. This data will be obtained by computation, and from a mathematical standpoint there is little ambiguity as to what the stresses will be in the different parts of well-designed trusses. Having made this computation, it may be said the trouble now begins. Knowing the stresses which each member should bear it must be found out in some style of trusses whether the disposition of material and quality of workmanship enable such a disposition of loads to be effected, and where imperfections exist, learn of their extent. Finally, the most difficult part of the task is reached when we undertake to learn of the quality of the material, and whether it is capable of sustaining the imposed loads, not only for the present, but whether there is liability to deterioration which will detract from its durability and ultimate safety. As to the mathematical parts of the problem, engineers are in accord, generally speaking; hence this part of the subject will not be dwelt upon. Questions relating to the strength and durability of metals cannot be answered with the same degree of precision.

The subject of the strength of materials is a complex one in its different bearings, and our knowledge is derived from the combined experience of practical men, who for years have been close observers of the behavior of metals under the actual conditions of practice; also from the results of numerous special experiments, which have been executed for the direct purpose of following up different lines of investigation. Information derived in this last manner is of the most trustworthy character; whereas, in actual railroad practice, facts may be observed which involve several unknown elements, to eliminate which years may elapse before the opportunity arrives. In the case of special experiments, by investigating one unknown element at a time the correct solution of the problem is soon reached. There are cases, however, in which the element of time itself is the unknown factor, and the experiment of necessity extends over a long period. Work of this character, both scientific and practical, as regards the immediate value of the tests, has now been going on with the United States testing machine of 800,000 pounds capacity, at the Watertown Arsenal, for over seven years, during which time there has been tested to destruction constructive material to the extent of over 320,000 pounds weight, and of which railway material has formed an important part. A perusal of the annual reports of these tests, a congressional document for public distribution, will show that extensive tests have been made with full-sized bridge columns, with tension members, riveted joints and other details of construction. These numerous tests have established many important facts, and ruthlessly destroyed fallacious theories.

Inasmuch as it is usually quite an easy matter to criticize existing affairs in a general way without adding materially to the common stock of knowledge, it may be desirable to change the programme and direct our attention chiefly to facts, and those features which bear directly upon the intelligent use of constructive material. In the tensile test of iron and steel we have its modulus of elasticity, elastic limit, tensile strength, elongation, contraction of area at point of

double the elastic stretch. It is found, however, that when a piece of iron or steel is stretched beyond the elastic limit, and a "permanent set," so called, given the metal, a disturbance is caused in the modulus of elasticity, temporary, however, and from which the metal recovers within a few days. While this disturbance exists the elastic elongation increases more rapidly than the loads increase. This fact is suggestive of fatigue or of some loss of cohesion in the

are erected although some of the members may have been in the process of manufacture, the effects of heat will not be discussed. In case a load of tension is applied exceeding the "natural" or primitive elastic limit a new elastic limit is formed equal to and sometimes exceeding that load. In this manner a new elastic limit may be formed anywhere up to nearly the tensile strength. It will be seen from this how little importance can be attached to the elastic limit unless it is known how it was formed, and when an engineer says the working stresses should never exceed the elastic limit, and does not define that limit, taken strictly, that only means that the tensile strength shall not be exceeded, which must be obvious to any one.

This brings up for consideration an interesting point in regard to the hangers used in the Bussey Bridge, to the eccentricity of which was attributed their failure, notwithstanding the fact that an actual test of the only remaining hanger showed a tensile strength several times the load estimated to have come upon it in the bridge and the refusal of a new eccentric hanger to break in the eccentric part. No doubt the primitive elastic limit on account of eccentricity of load is soon reached, but then a new elastic limit would be formed and continue to be elevated as the weight of trains was increased. The question is, Which elastic limit, if any, had anything to do with the ultimate failure? The resemblance of the failure of the hangers to the grooving of steam boiler plates suggests another explanation. An illustration presenting an ethical case of elevation of elastic limit is found in piano wire, which is strained probably beyond even the tensile strength of the annealed wire, remains in this state for years, and whose entire business is to vibrate. Passing on to the tensile strength of a metal, this is the load which once applied, and gradually increased, produces rupture. This property is influenced by previous mechanical treatment, and, generally speaking, the same treatment which causes an elevation of elastic limit also causes an elevation in tensile strength. In this way bars which were tested to rupture at the Watertown Arsenal four years ago, and gave a tensile strength of 52,000 pounds per square inch, now a retest of the fractured ends show a tensile strength of about 62,000 to 64,000 pounds per square inch. This feature led the late Sir William Siemens to remark of the mild steel made by his process that any so-called

tive elastic limit comes into use to assist in correcting imperfect mechanical adjustments of parts of structures. Contraction of area occurs locally after the maximum load has been passed, and marks the place where rupture occurs, the character of the broken surface showing fibrous or silky in ductile iron and steel and granular in brittle metal.

The quality of a metal is judged by the physical properties above described, and there is a wide range of properties over which an inspector has to pass judgment when the material is accessible for test. In a bridge but little can be done; the parts are generally so well painted that they are nearly or quite invisible, and, even if exposed to view, the quality of the metal could not be thereby ascertained. If the loads in the bridge exceed the primitive elastic limit, it may be ascertained by the surface scale (magnetic oxide) starting off, as this scale will start off at that time. There is no known method of determining whether a bar is ductile or brittle except by testing it and developing these qualities, and this, of course, unfit it for use. Out of a lot of metal made from one grade of stock in the wrought iron or out of the same heat in a lot of steel, we have reasonable assurance that there will be uniformity within certain limits; therefore it is possible in new work to provide suitable metal from a comparatively small number of tests. But in the case of old material uncertainty exists as to the quality of the metal. As to the earlier methods of manufacture, we are unpleasantly certain a great many welds were used, and some of them may be, and doubtless are, imperfect. It is a very good weld that will sustain 80 per cent. of the strength of the solid bar. Most blacksmiths entertain exaggerated notions of their ability to weld iron, the opportunity of witnessing their work tested would dispel the illusion.

Experiments upon the effect of suddenly applied loads have shown that tough metal is not thereby rendered brittle. Colonel Maitland, of the English army, cites his experiments which were made for the purpose of developing brittleness by suddenness of fracture. The material which was employed gave an elongation in the testing machine of 35 per cent. When ruptured by a falling weight the elongation was increased. Thinking that was not rupturing the specimen quick enough, he employed gunpowder with the same result as before; he then used dynamite, and finally gun cotton, when the elongation of the specimen actually rose to about 65 per cent. It is needless to remark what his conclusions were. Other experiments which have been made with falling weights striking upon flat plates showed that both strength and toughness were retained by the metal, as also did similar tests with cartridges of gunpowder and dynamite exploded against plates.

A source of danger when steel is employed for bridges and other uses is the presence of initial strains which may be in

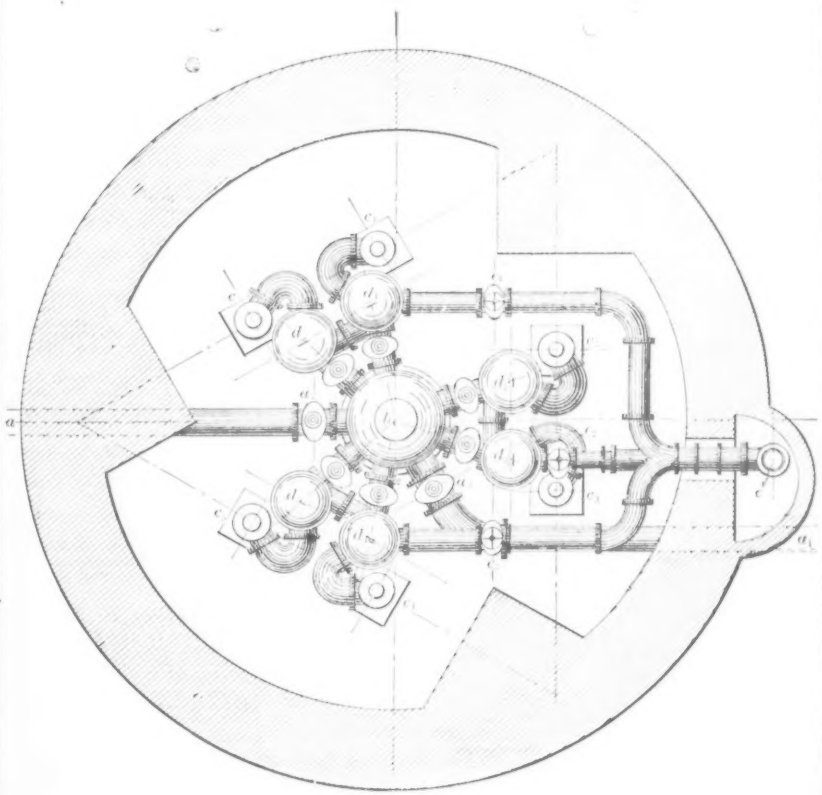


Fig. 2.—Plan of Pump Pit.

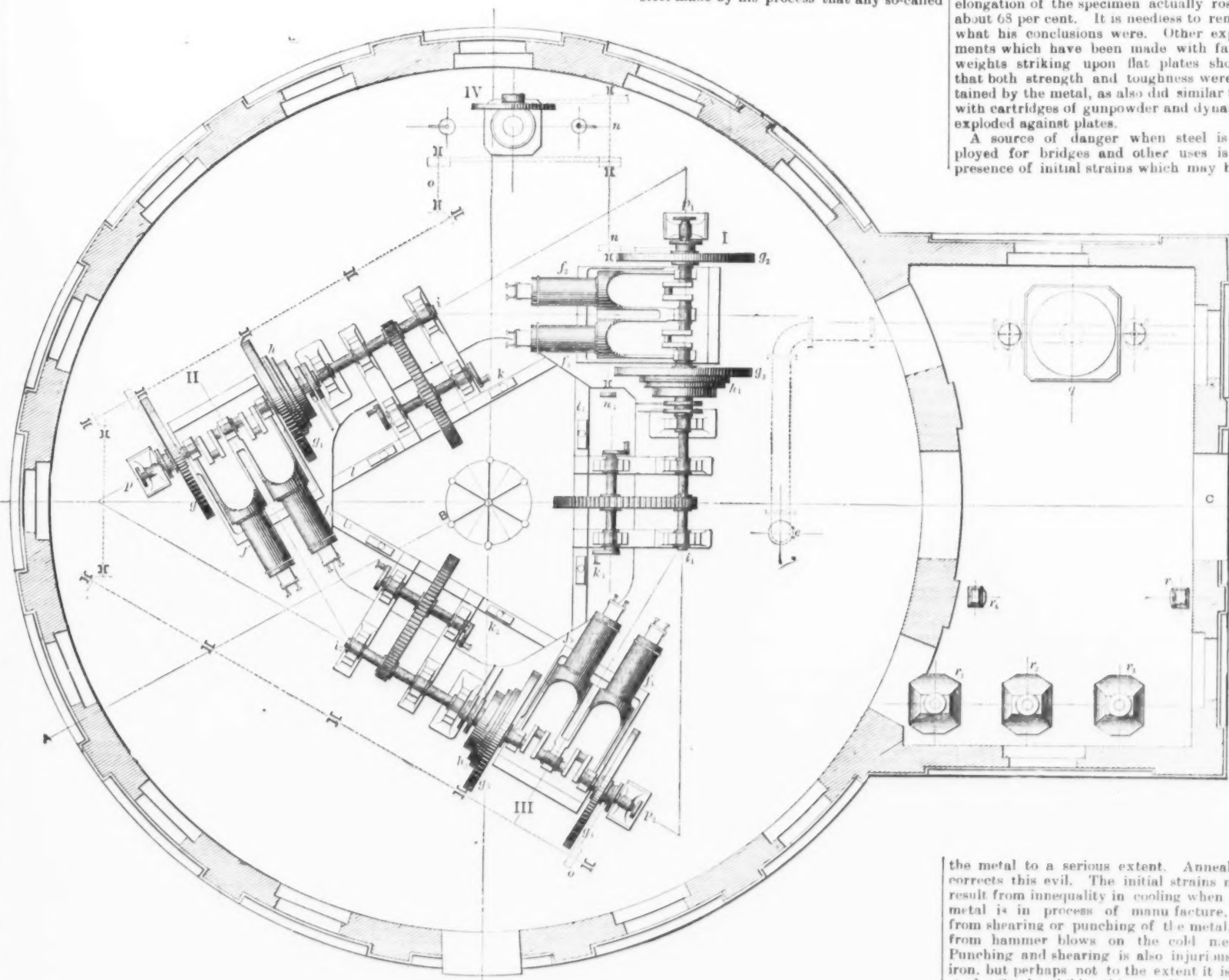


Fig. 3.—Plan.

WATER WORKS AT COBLENZ, GERMANY, DRIVEN BY OTTO GAS ENGINES.

rupture, and character of broken surface. Each of these are useful features to know. Temporary magnetism is more or less strongly excited and the polarity of the fractured specimens enable their relative positions in the testing machine to be identified. Efforts which have been made to judge of the physical properties of metals from magnetic observations have thus far been unsuccessful.

The modulus of elasticity is a measure of the elasticity of the material within its elastic limit, and indicates the amount of extension or compression under given loads, and which the material entirely recovers from when the loads are released. Thus a piece of mild steel will elongate about one-thousandth of its length, when loaded to its elastic limit, and recover that amount when the load is removed. The amount of this elasticity displayed is in direct proportion to the load applied. Double the load produces

metal, but anything said about this peculiar behavior beyond noting the above facts is conjectural. It is necessary to consider somewhat at length these rather abstruse parts of the problem, in order to show what does or does not appear to influence the durability of our iron and steel structures. In regard to the elastic limit, this may be found to range, say, from 30 per cent of the tensile strength of the metal up to nearly its tensile strength, according to the previous manipulation of the metal or the influence of its chemical composition. Some steel-makers call the "natural" elastic limit that which results from finishing the metal at a red heat and allowing it to cool in the open air. The "natural" elastic limit may be elevated by cold stretching, cold rolling, cold hammering or wire drawing. Steel is hardened by sudden cooling from a high temperature, but as bridges are not subjected to this kind of treatment after they

maltreatment to which that metal was subjected only led to increasing its strength. It is an important piece of evidence now wanting that will show, if such is the case, when a change occurs in the cohesion of the metal and this force ceases to increase, turns about and diminishes. Until this is clearly demonstrated, and while there are other reasonable explanations why metals fail, we may be excused from undue anxiety on the subject of deterioration of metals as commonly understood. Elongation is displayed by the metal between the load at the elastic limit and tensile strength, its maximum amount ranging from less than 1 per cent in hard steels and cast iron to above 30 per cent in mild steel and soft grades of wrought iron. Treatment which elevates the elastic limit and tensile strength detracts from its power of elongation. No doubt in many instances the ability to elongate or compress under loads exceeding the primi-

the metal to a serious extent. Annealing corrects this evil. The initial strains may result from inequality in cooling when the metal is in process of manufacture, or from shearing or punching of the metal, or from hammer blows on the cold metal. Punching and shearing is also injurious to iron, but perhaps not to the extent it is in steel. Steel exhibits this peculiarity, that when sheared or punched the scale in that vicinity starts off in lines, which extend out in the solid metal, which seems to indicate that lines of strains sharply defined may penetrate the steel and not distribute themselves over much surface. May not these lines of strain reach sufficient intensity to cause that brittleness of fracture which at times occurs so unaccountably? Sharp corners should be avoided; also nicks in the edges of steel bars.

A tough and fibrous metal when nicked around the outside will break short and brittle. Now, suppose a nick was inside the bar, if it were possible to get one there, doubtless brittleness would result. A near approach to an interior nick is found in the case of a blow hole in the steel which has not in the process of manufacture been flattened out in the direction of the line of pull. This causes brittleness in fracture, and, as most steel rails are reported to fracture, when they do at all, in the first few months of their service, it is very probable that interior defects of this nature and initial strains are the causes. Certainly, if it were deterioration in quality from use, fractures would be more frequent, instead of less, as time elapsed.

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Lundberg Gustaf

Chaffee's Leather Head Mallets.

H. H. & C. L. Munger, 142 Lake street, Chicago, are Western agents for the sale of a novelty in leather head mallets, patented January 13, 1887, and manufactured by E. M. Chaffee, Onondago Valley, N. Y. These mallets are made with sole leather heads,

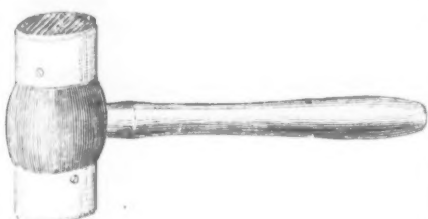


Fig. 1.—Chaffee's Leather Head Mallet.

pressed under 5 tons pressure, inclosed with a malleable iron band, as shown in the accompanying cut, Fig. 1, a sectional view being given in Fig. 2. The heads are made of maple and the handles of ironwood or hickory. The handles are inserted in the head in such a way as to insure their permanent retention, having a screw-thread cut in the deepest part of the socket to receive a corresponding thread cut on the end of the handle, as illustrated herewith, Fig. 2. The handle is also made tapering so that its greatest strength is attained at the point of greatest strain. The heads are

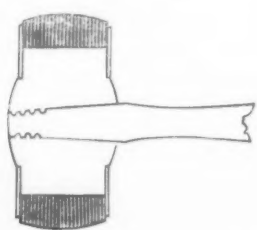
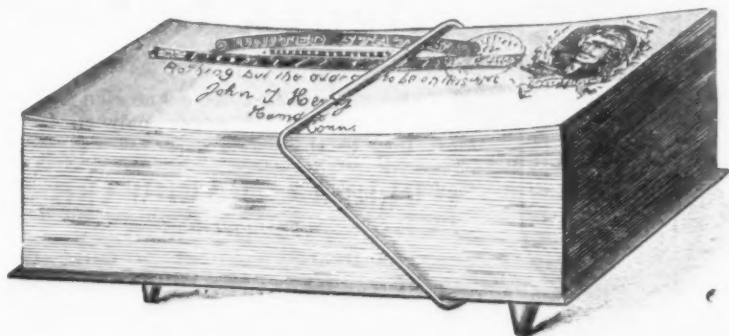


Fig. 2.—Sectional View of Mallet.

calculated to stand a great deal of wear, but are so constructed as to be easily replaced. Several sizes are made.

Henry's Postal Card File.

The illustration given herewith represents a postal card file, which is manufactured by John T. Henry, Hamden, Conn., whose pruning shears, &c., are well known to the trade. The illustration represents the file as about half-filled with postal cards, the file having a capacity, it is stated, of holding about 150 cards. The cards are held by means of a steel spring on the under side, which actuates a steel wire clamp, holding



Henry's Postal Card File.

the card with a steady pressure, whether there are few or many. The cards can obviously be removed or replaced with facility. The files are bronzed, packed in paper boxes, one dozen in a box.

The Anthony Wayne Washer.

The Anthony Wayne Manufacturing Company, Fort Wayne, Indiana, are manufacturing this washer, which is illustrated in the cuts given below. Fig. 1 gives a general view of the machine, and Fig. 2 shows the inside or cage, and together they indicate the principle on which the washer works. The main features of this washer are as follows: 1. In the gearing of the machine, as



Fig. 1.—The Anthony Wayne Washer.

shown in Fig. 1, a lever movement is employed which gives the agitator inside of the tub a rapid rotary reciprocating motion, and turns the pin-wheel or agitator completely once around by moving the handle attached to the lever about 22 inches up or down on a pump-handle motion. The point is made that in other machines the handle must be turned clear over from one side of the ma-

chine to the other, to accomplish the same object. 2. Special attention is called to the crib work or cage which is placed inside of the tub, and which can be detached by lifting out. This feature is alluded to as not only giving the machine an increased washing surface as the clothes are rubbed all round, and on the bottom of the tubs on a wash-board, but also as giving a water friction, thereby cleansing the clothes more quickly and thoroughly than with other constructions. 3. The cage has an extra bottom ring $1\frac{1}{2}$ inches thick, on which



Fig. 2.—"Cage" of Washer.

are fastened the ribs forming the washboard below. This ring is raised $\frac{1}{4}$ inch from the bottom of the tub, thereby giving a space of $1\frac{1}{4}$ inches from the bottom of the tub to the upper side of the bottom of the cage, thus giving room for all heavy settlements to pass through the openings between the ribs and enter into this space, so that they will not wash into the clothes again through the action of the agitator. 4. The ease with which the machine is handled, its efficiency in doing its work, and its appearance, are points that are alluded to by the company.

New Water Pot.

The accompanying engraving represents the Iron Clad French Water Pot, which is made by the Iron Clad Mfg. Co., New York. It is a novelty to the trade, although in general design it is borrowed, in some measure, from the practice of French and

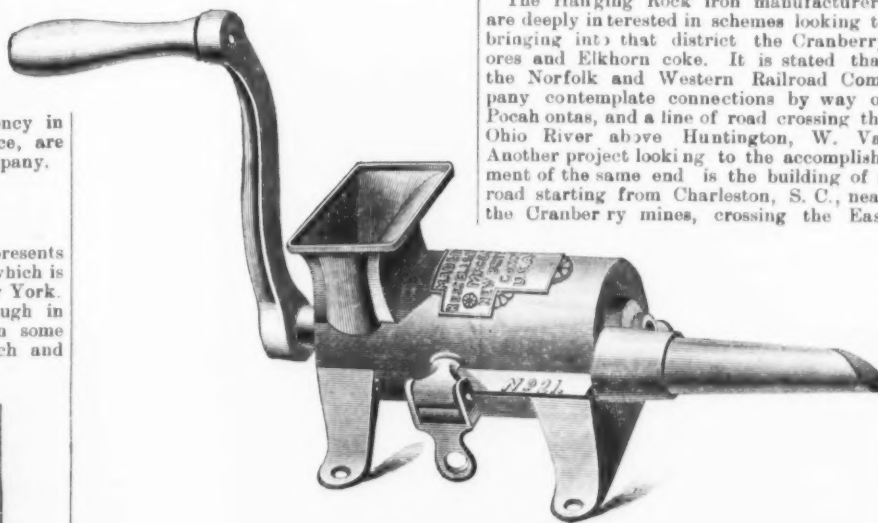


Fig. 1.—The Home Meat Cutter.

ure valves are of the piston type, all being worked by the ordinary link motion and eccentrics. The engine-room is not far from the mid-length of the boat, and one boiler is placed ahead and the other astern of it. Each boiler is so arranged that it will supply either engine or both, at pleasure. The boat has therefore two funnels, one forward and the other aft, and air is supplied to the furnaces by two fans, one fixed on the forward and the other on the aft bulkhead of the engine-room. The fan engines have cylinders $5\frac{1}{2}$ inches diameter and $3\frac{1}{2}$ inches stroke, and make about 1100 revolutions per minute when at full speed, causing a plenum in the stokeholes of about 6 inches water pressure. Double steam steering gear is fitted, for the forward and

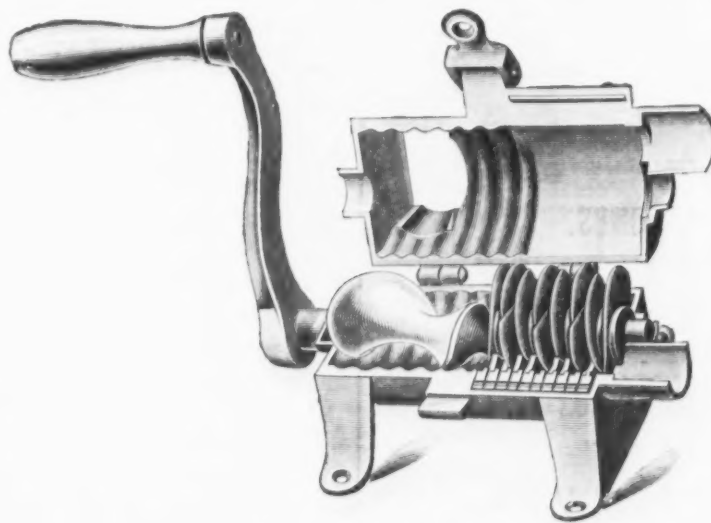


Fig. 2.—The Home Meat Cutter, Interior View.

The Home Meat Cutter.

The Russell & Erwin Mfg. Company, New Britain, Conn., and New York, are manufacturing the Home Meat Cutter and Stuffer, which is represented in the accompanying illustrations, Fig. 1 giving a general view of it, and Fig. 2 representing it open, with a view to showing its interior construction, the arrangement of cutting knives, &c. This cutter is made with a 6-inch cylinder, and is furnished either japanned or galvanized. The facility with which it will cut the meat is especially alluded to, its capacity being given as 3 pounds of meat per minute, while at the same time emphasis is laid upon

aft rudder respectively, and safety from foundering is provided to an unusual degree by the subdivision of the hull into numerous compartments, each of which is fitted with a huge ejector, capable of throwing overboard a great body of water; a body of water equal to the whole displacement of the boat can be discharged in less than seven minutes. There is also a centrifugal pump provided, which can draw from any compartment. The circulating pump is not available because it has virtually no existence, a very small pump on the same shaft as the centrifugal being used merely to drain the condensers. These last are of copper, cylindrical, and fitted with pipes through which a tremendous current of water is set up by the passage of the boat through the sea. Thus

ing pit, so as to extend directly under the pigs cast in the usual manner. These chains are seized by grappling hooks attached to the lower end of a piston-rod traveling in a cylinder mounted on a short stationary track. It will be readily understood that by moving the piston upward the pigs are caught by the two chains and can be easily conveyed from the casting pit. Mr. Seigh estimates that by the use of this invention two men and a boy can perform the work of seven men with the ordinary method.

The S. P. Wetherill Company, Limited, and the Leigh Zinc and Iron Company have removed their offices to No. 112 John street, New York.

WASHINGTON NEWS.

(From Our Regular Correspondent.)
WASHINGTON, D. C., May 17, 1887.

It was intimated in Administration circles to-day that the only way to treat the tariff question in the Congress which will assemble in December, or sooner should there be a necessity for an extra session, will be for the Secretary of the Treasury to collate and compare the various measures proposed, and to confer with such persons as Carlisle, Randall and others in and out of Congress, and upon that basis construct a compromise measure which will meet with the general support of the majority of the House of Representatives. It is claimed that this will be the only method by which some uniformity of action and agreement of views may be reached. The Members of the Administration seem to fully realize the folly of going into another Congress, and in the face of a national election, without taking some pronounced position on the question of the tariff. As the protection wing of the Democratic party in the House is fully as strong in this as it was in the last House, they see but one way out of the dilemma, and that is by way of a compromise measure. The Secretary of the Treasury has already given the subject some preliminary consideration, and will take the matter up for definite action and expression of views in the Cabinet before embarking in the work. It seems to be his present idea to confer with the gentlemen representing the different views, and to make an effort to bring them together, so that a bill may be submitted in his annual communication to Congress, or, in a less formal manner, for caucus consideration.

In a general way it is ascertained from several gentlemen connected with the Administration that the sentiment there is that there ought to be a reduction of duties and an increase of the free list. Some put it on the ground of reduction of revenue, and others on supposed public opinion on the subject. What articles would be affected can only be judged inferentially. Free raw materials is one of their economic hobbies. Reduction on steel rails is another. They are not certain about pig iron, but favor reduction on certain textiles. The summer months will be devoted to this subject, so as to be ready soon after the meeting of Congress, whether in October or December.

MR. RANDALL ON SOUTHERN INDUSTRY.

Representative Randall, a few days ago, visited the location of the proposed plant of the Arrow Steamship Company, at Alexandria, Va. The object of the company is to construct steamers under recent patents, designed to cross the Atlantic, from New York to Queenstown, in six days. Mr. Randall, speaking of the advantages of Virginia in industrial growth, said: "The State of Virginia conveys some important points in a study of the economic history of this country. She possesses vast wealth of raw materials, like iron and fuel, abundance of water, and all the requisite of important industries, and yet from first in the rank of States at the beginning of the Government she is now fourteenth, and if we include West Virginia, once part of her territory, she would be sixth." Again he said: "The economic conditions forced upon the South by slavery heavily handicapped Virginia, but she has not gone ahead since that time as rapidly as Missouri, Georgia, Kentucky, Tennessee, Alabama and Texas. The people of Virginia are realizing this, and great strides have been made within the past few years." Referring to the political aspects of the question, Mr. Randall called attention to Virginia as illustrating the progress of protective ideas in that State within the past two years. He called attention to the fact that the party leaders would have to recognize the current of events or they would lose their hold. Virginia, which had a strong free-trade Democratic delegation in the Forty-ninth Congress, in the Fiftieth has a decided majority of Republican protectionists. He says unless the free-trade Democrats call a halt a similar revolution will be witnessed in other States of the South. Mr. Randall simply regards recent events as conveying the lessons of the times, and he is anxious in the interests of success that the situation should be carefully understood before it is too late.

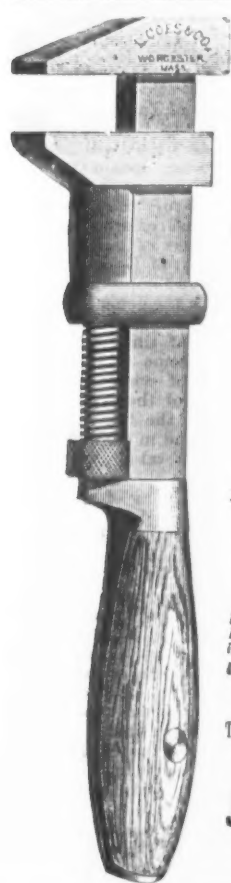
INTERSTATE COMMERCE.

The Interstate Commerce question appears to be working itself out very rapidly. The Senators and Representatives who are still here or drop in on a flying visit do not materially differ in their opinions that one of the first steps in the coming Congress will be either the repeal or a very radical modification of the measure, in the granting of more defined authority to the commission. The act is a sort of boomerang—the people who expected to be benefited are worse off for its existence and the railroads are making money. Instead of the long and short haul provisions as they stand, an attempt is to be made to pro rate charges on a defined scale of freights.

The Austrian journals relate the following curious story: The Rimamuranyer Iron Company send bar iron, which in Hungary is sold at the combination price of 11 florins, to Servia at $6\frac{1}{2}$ florins, in order to compete there with the German and English iron. A sharp Servian merchant ordered a number of cars of bar iron, having it delivered at Belgrade. He then immediately sent it back to different points in Hungary, selling it at 10 florins. It is stated that in this way he made \$10,000 in a single month before the Hungarian iron works had obtained knowledge of his operations.

The unsatisfactory condition of the wire-rod trade in Germany has led to the consideration of the question whether it would not be possible to revive the wire-rod association in that country. It expired on the 1st of July last, and it is proposed now to call an early meeting of the wire-rod trade, with the object of patching up another association.

Work on the Hudson River Tunnel, which has been suspended for four years, was resumed again a short time ago.



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GENUINE IMPROVED
Knife Handle
PATENT
Screw Wrenches

MANUFACTURED BY
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Worcester Mass.

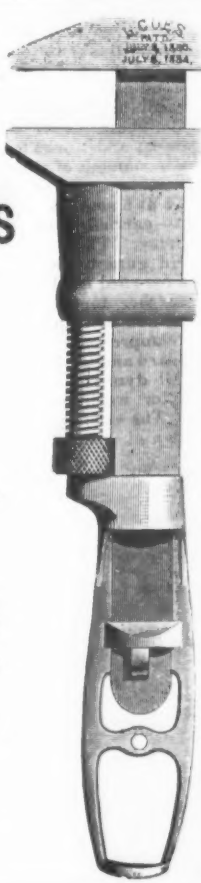
ESTABLISHED IN 1839.



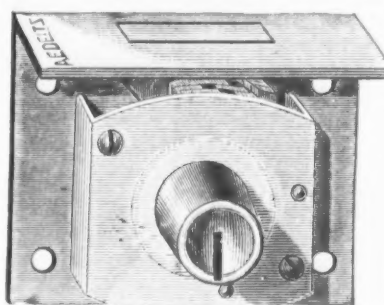
Sectional view illustrates our NEW
KNIFE HANDLE, showing Malleable
Iron Frame and Shank of Bar keyed
into position.
1/2" Straight Bar, Extra LONG NUT
FOR SCREW IN JAW

The Best Made and Strongest Wrench in the Market.
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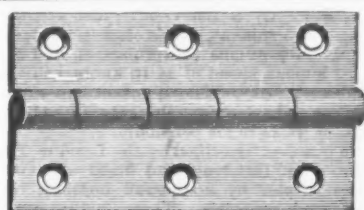
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Mair Belting Co.,
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THE LEVIATHAN
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BELTING.

Unsurpassed for
Strength, Durability and
Cheapness.
Made to any Length,
Width and Strength
Main Driving Belts.
Guaranteed to Run
Straight, Even Through
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No Cross Joints, Un-
affected by Damp,
Clings well to the Pulley.
Has no equal. In fact,
is THE BELT.

**MAIN BELTING
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Also
248 East Randolph St.,
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Are the Leaders of the World.

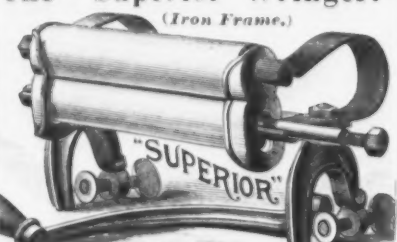


An entirely novel
construction. "They
have no equal." No
Cog Wheels, Ratchets,
Pawls, Gum Balls or
other Friction De-
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short time. Easy Mo-
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Noiseless and Dura-
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give entire satisfac-
tion. Write for cata-
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The "Superior Wringer."



Fully Warranted. Has Patent Adhesive Rolls.
Best Steel Springs, Malleable Iron Crank.

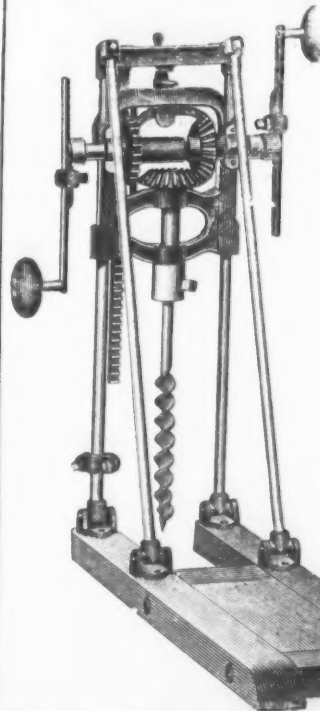
Send for fully illustrated Catalogue and Price-
List of thirty different styles and sizes of Wringers.
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ORE JIGS.

The attention of Hematite ore miners is called to
our new Jig. The simplest and most effective
separator now in use.

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Manufacturers of Ore Washers, Screens, Eleva-
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MILLERS FALLS BORING MACHINE.



THIS Machine has been fully perfected in all its
parts, and is now sold with full warrant that it
will do better work and give better satisfaction than
any other kind in use. The frame is made of half-
inch round steel rods; the braces are the same and
attach to the rods at the top by a set screw. When
this set screw is loosened, the frame falls over so as to
bore at any desired angle.

The depth of hole to be bored is fixed by a stop, as
seen on the left hand upright rod in the cut. When
the gate strikes this stop a latch is lifted and the ma-
chine throws itself into gear by the use of a spring,
and the Auger is lifted out of the hole by continuing to
turn the crank in the same direction.

When the Auger is drawn from the hole the frame
hangs itself up until the machine is moved to the next
hole, then it is dropped down by turning the crank
back until the Auger strikes the wood, when it is
thrown out of gear and proceeds to bore the next
hole. As seen in the cut, the machine has adjustable
cranks which fully regulate its speed and power.

PRICES:

Machine, without Augers, - - \$7.50

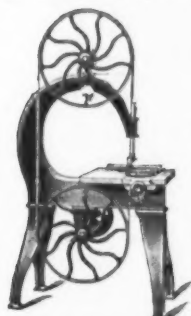
Augers in sets, 18, 23, 41 quarters.

\$3.00 \$3.75 \$6.75.

Sizes of Augers (1, 1 1/2, 2) (1, 1 1/4, 1 1/2, 2)
(1/2, 3/8, 3/4, 1, 1 1/4, 1 1/2, 1 3/4, 2)

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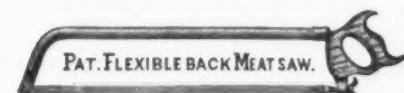


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For Cutting Iron, Steel, Brass, Plate, Piping, &c.,
ONE OF THE GREATEST LABOR SAVING MACHINES EVER USED.

Metal cut quicker and at less cost than by the use of the
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The teeth of our Flexible Back Band Saws are hardened so that a file
will not touch them, consequently they will cut any metal that can be cut
with the best back saw ever known. They never break when properly
used as the back is soft. They are discarded when worn out but cause
their exceeding cheapness warrants it.

The Band Saw Machine specially constructed for our Patent Flex-
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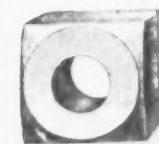
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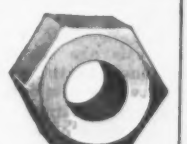
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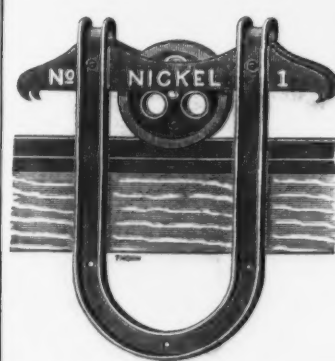


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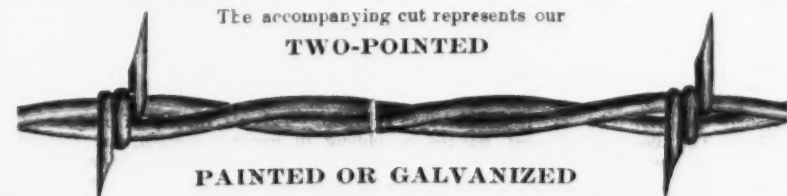
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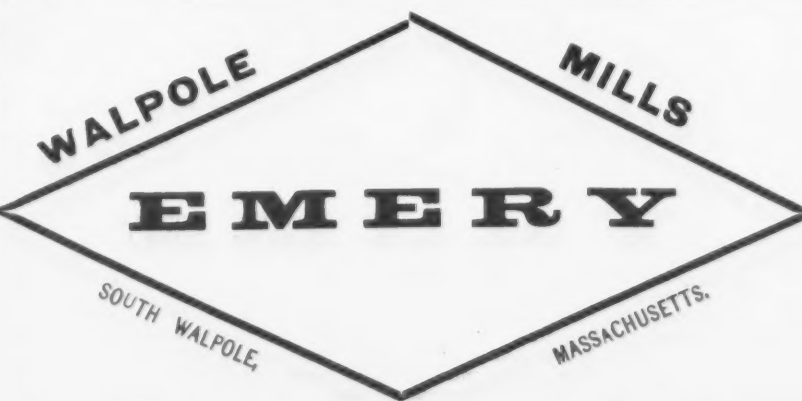
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are a pair, 30 x 60. The fly-wheel is 30 feet in diameter and arranged for 30 ropes. They are built after designs by E. D. Leavitt, Jr., Cambridgeport, Mass., and will develop 1500 horse power.

George Suarez, of Buenos Ayres, Argentine Republic, S. A., was in Pittsburgh last week for the purpose of purchasing different kinds of machinery. He says that machinery made in the United States is very popular in South America. It is much lighter than that manufactured in Europe, and is more durable. He thinks a line of steamers should be run between the United States and that Republic to accommodate the rapidly growing trade between the two countries.

The Grant Locomotive Works, of Paterson, N. J., recently shipped through Messrs. Russell & Co., of China, the first locomotive engine ever built in America for use in China. It goes to the Kaiping Railway Company, Limited, which controls the Kaiping coal mines, about 75 miles northeast of Tientsin, in the province of Chihli, and has a railroad of standard gauge, 28 miles long, and used for hauling coal.

E. P. Allis & Co., of the Reliance Works, at Milwaukee, Wis., have received a large order for blowers from Birmingham, Ala. They are reported to be intended for blast furnace use.

A four-page circular is being sent out by the Waltham Emery Wheel Company, of Waltham, Mass., giving directions for ordering emery wheels, facts of general interest to emery wheel users, and a price list and table of sizes of the Richardson wheel, which is made by the company.

The Smith, Beggs & Ranken Machine Company, St. Louis, Mo., are building two Corliss engines for the proposed Franklin avenue cable line, each 30 x 60, or of about 500 horse-power each.

The Link Belt Machinery Company, Chicago, Ill., are making three continuous freight elevators for the Chicago, Milwaukee and St. Paul Railway's freight house.

James Leffel & Co., of Springfield, Ohio, have issued a new and very attractive catalogue of small engines and boilers, and illustrating also the Leffel turbine. The engines range from about 8 to 16 horse-power, and will prove interesting to small power users. The catalogue is fully illustrated.

Messrs. Bradley & Co., of Syracuse, N. Y., builders of forges, hammers, &c., have removed their branch office in New York City from 22 College Place to 32 and 38 College Place, corner of Murray street.

The John H. McGowan Company, of Cincinnati, Ohio, manufacturers of steam, hand and power pumps, and general supplies, announced in a recently issued circular that Mr. John W. Neil has been elected secretary of the company by the Board of Directors in place of Mr. Robert Laidlaw, who has disposed of his entire stock and interest in the company, and retired from the business. In connection with this announcement, they state that they have greatly increased their facilities in the way of new machinery and tools in their foundry, brass work department, and machine shop.

The Pratt & Whitney Company, Hartford, Conn., are making 150 Gardner improved machine guns for the Italian Government. They have 525 men employed now, against 425 in 1886.

William Tod & Co., of Youngstown, Ohio, are running their shops 22 hours per day to meet the demand for their Porter-Hamilton engines and Hamilton blowing engines.

Charles Barnes & Co. have opened a new machine shop at Nos. 38 and 40 Sycamore street, Cincinnati, Ohio. They will build automatic engines and buy and sell engines and boilers.

E. & B. Holmes, Buffalo, N. Y., manufacturers of barrel, keg and hoghead machinery, have extended their line of goods, and will hereafter manufacture a full line of wood-working machinery in connection with their old business.

Tinius Olsen & Co., of Philadelphia, Pa., manufacturers of testing and hoisting machines, presses, scales, &c., report the following orders: A 200,000-pound testing machine for the Pencoyd Iron Works; a 50,000-pound machine for the Chicago Tire and Spring Works; a 60,000-pound machine and spring tester for the Chicago and Northwestern Railroad Company; nine 40,000-pound testing machines for the United States Government Boiler Inspection Service; also a foundry testing machine for A. W. Stevens, Auburn, N. Y.

Hardware.

Last week, the mill of the Iowa Barb Wire Company, at Allentown, Pa., turned out 250 tons of barb wire.—*Catskill, N. Y., Dispatch.*

The Anthony Wayne Mfg. Company, Fort Wayne, Ind., recently moved into larger quarters, and are now occupying two floors 40 feet wide by 80 feet long, thereby increasing largely their capacity. As soon as their new machinery, which is in course of construction, is in operation, they estimate that they will be able to make from 35 to 40 of their washing machines per day. The demand for these machines is referred to as having been so active that they have given little attention to the manufacture of towel racks, broom and vegetable cutters, and other household articles which they intended to make.

The establishment of the Baker Wagon Iron and Chain Company, at Beaver Falls, Pa., was completely destroyed by fire on the 11th inst., causing a loss of about \$60,000, with an insurance of \$35,000. It was owned by J. H. Baker, of Beaver Falls and Oliver Bros. & Phillips, of Pittsburgh. It is expected that the works will be rebuilt at once.

The Patton Mfg. Company, of Jeffersonville, Ind., which is a branch of the original firm of that name operating in Columbus, Ohio, are now firmly established inside the walls of the prison, south. They occupy the shops and some of the machinery, as did the Perin & Gaff Mfg. Company, their predecessors in the convict contract, and are at

present working about 150 hands, but when running full will employ 250 convicts. The prisoners soon become accustomed to the molding, and give general satisfaction as operatives. The company use principally Southern iron, and turn out over 9 tons of castings per day, making only hollow-ware of all kinds. They are well pleased with the outlook, and have contracted for the convicts for a term of five years. There are about 900 convicts, and besides the Patton Mfg. Company there are a boot and shoe department belonging to a St. Louis house and saddle-tree manufactory, of Louisville.

Miscellaneous.

The Philadelphia (Westinghouse) Natural Gas Company, of Pittsburgh, declared their usual monthly dividend on the 11th inst. on a capital stock of \$6,500,000.

The Lehigh Valley Car Company, of Allentown, Pa., were chartered on the 10th inst. with a capital stock of \$125,000. The works are located at Stenton, Pa.

We take the following from the Cleveland, Ohio, *Trade Review*: "The citizens of Cleveland are fully awakened to the importance of setting the question whether natural gas can be found within or near the city in paying quantities. At the last meeting of the Board of Industry, trustees were appointed to take charge of the collection and disbursement of a fund of \$50,000, with power to sink a series of wells to such depths as they see proper. If gas is found, the subscribers to the fund will have issued to them, pro rata, stock in the company to be then organized. The next 60 days will be fraught with much interest to the manufacturers of Cleveland, as from the character of the trustees it is safe to presume that not a stone will be left unturned to secure the much-desired new fuel."

The Bolivar Coal and Coke Company, which was organized some months ago at Pittsburgh, with the modest capital of \$90,000, have since had capital in cash and coal land added by Eastern capitalists, giving them a fully paid-up capital of \$300,000. The company own 1200 acres of coking coal land along the Pennsylvania Railroad, between Bolivar and Lockport, which can be mined without either shafts or slopes. The work is now in progress, and within 60 days some of the ovens, of which 300 will be built, will be in operation. Geo. H. Anderson has been elected president and Major C. H. Tebbetts treasurer of the company.

The Odell Typewriter Company have been organized at Milwaukee, Wis., with a capital of \$100,000, for the manufacture and sale of typewriters. Incorporators, John E. Burton, C. H. Odell and L. J. Odell.

A company have been organized to lay pipe from Fort Wayne, Ind., to the natural gas field at Eaton, a distance of 48 miles.

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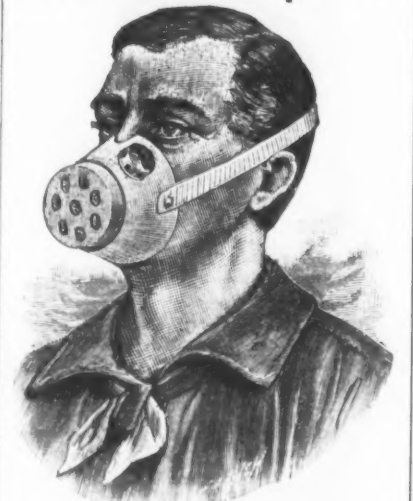
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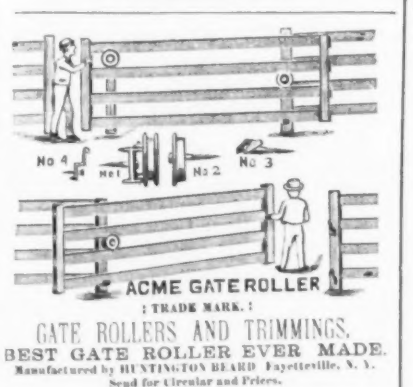
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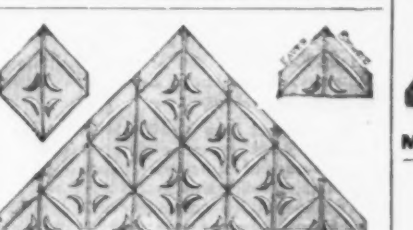
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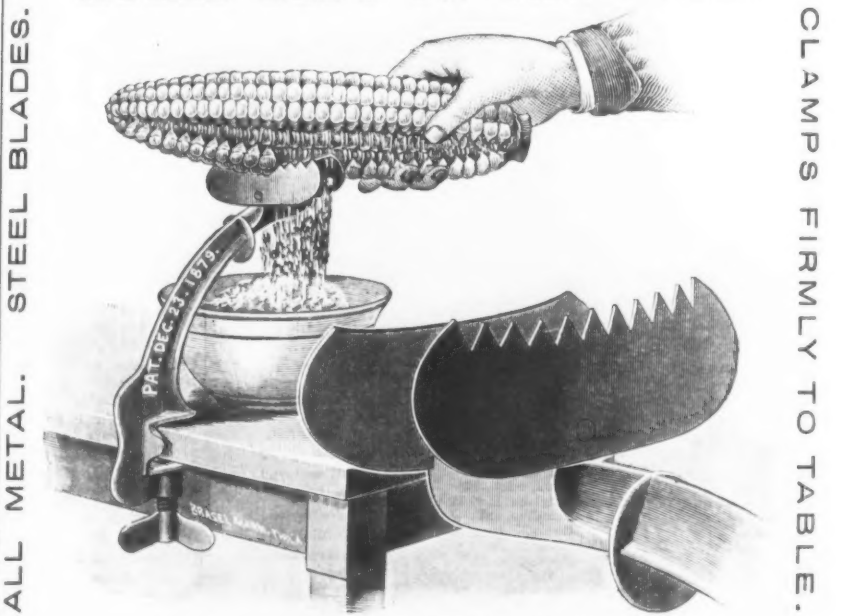
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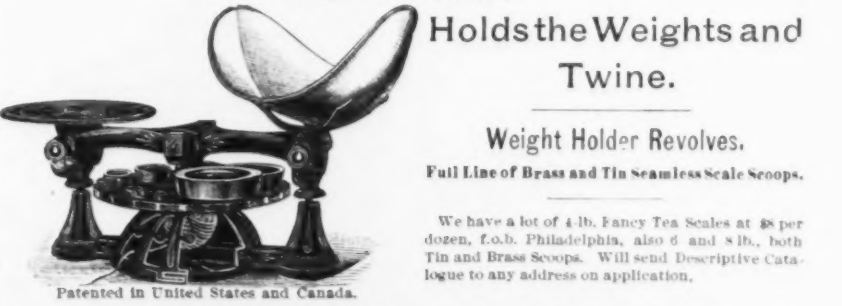
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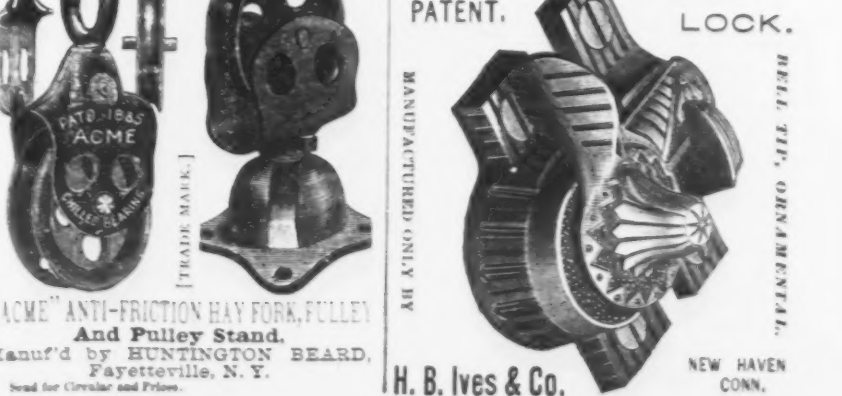
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IVES' PATENT SASH LOCK. MANUFACTURED ONLY BY **H. B. Ives & Co.** NEW HAVEN CONN.

MECHANICAL.

A New Friction Clutch.

Messrs. Moore & White, 1312-1316 Buttonwood street, Philadelphia, Pa., are putting on the market a simple form of friction clutch, which we illustrate in the accompanying engravings. The pulley, it

and unyielding grip on the flask, which does not give way under the great strain of melted iron and does not slip, from the fact that no wedges are used. It can also be used obliquely on the flask when too long for a vertical position and just as firmly secured, without the usual risk attending the old style clamp when so used. The power of the cam movement, moreover, is claimed to be found by actual test to be much greater than that obtained by the usual clamping-

start the car, 200 pounds; to maintain speed, 70 pounds. Selected portion of track, dry, level and in very good order: To start the car, 190 pounds; to maintain speed, 55 pounds. From this it will be seen that in the case of the track being in fair order, dry and approximately level, the frictional resistance of the car to start was 0.0468 of the total load, and to maintain speed it was 0.0163 of the total load, while in the case where the track was level and in very good order the coefficients were 0.0444 and 0.0128 respectively.

The Archimedeian Screw Pump.

In his serial article on "The Drainage of Fens and Low Lands by Steam Power," appearing in the *London Engineer*, Mr. W. H. Wheeler contributes the following interesting chapter to Archimedeian screw pumps. These pumps, although frequently used for lifting water from drains for the purpose of cleaning them out, and other similar purposes, have seldom been applied in England for the permanent drainage of land. They derive their name from Archimedes, the Syracusan, who lived 287 B. C., and invented this machine during his stay in Egypt for draining and irrigating land. They were subsequently used by the Romans. The Dutch have used them very extensively in Holland for raising water for the drainage of the Polders.

The screw pump consists of three parts: A solid cylinder in the center, called the core, to which is attached one or more spiral screws, and sometimes an external case. The number of screws running round the core varies from one in the simplest machine to three or four in those of larger character. The ends of the core terminate in gudgeons which revolve in bearings, the lower one fixed under the water, and the upper on a beam spanning the delivery opening. As

60°. The Romans usually made it 45°. In the most effective machines it varies between 30° and 40°.

The discharging power of these pumps varies so much with the different circumstances under which they are worked, depending on the number of threads, the angle at which they are placed, the angle at which the pump works, and other matters, that it is difficult to give any precise formula for the quantity discharged. Upon pumps working under nearly similar conditions the discharge is as the cube of the diameter, and approximately it may be taken that, under favorable conditions, a pump 1 foot in diameter will discharge 0.32 cubic feet of water for every revolution. The number of revolutions varies according to the kind of power applied and the size of the pump. Small pumps of about 1 foot in diameter may be run at 60 revolutions a minute, the larger not reaching more than 20. For drainage purposes it may be taken that these pumps can be run at from 20 to 40 revolutions a minute. They have been used in Holland to lift the water 15 feet. Mr. Korevaer, a Dutch engineer, who has investigated the matter, places the limit of height at 14 feet, and the limit of discharge at 3500 (98½ tons) cubic feet per minute. The 10 screws erected at Katatbeh, in Egypt, discharged 137½ tons a minute each, making five to six revolutions a minute. The screws were inclosed in iron cases, but were found unequal to the weight of the water they had to carry, and were consequently removed. Where the amount of water to be lifted much exceeds the useful capacity of these pumps it is customary to couple several together, all worked by the same engine. The useful effect of these pumps is about the same as scoop wheels, and varies, according to the construction, from 50 to 85 per

Air Atomizers for Liquid Fuel on Board Ship.

The *London Times* in a recent issue refers to the substitution of air for steam atomizers for the utilization of liquid fuel on board ship.

A legitimate objection, says the *Times*, to the adoption of liquid fuel at sea under certain circumstances has been that the use of steam for the diffusion of the oil in the boiler furnaces entails a considerable loss of fresh water from the boilers. As this loss has to be made good by salt water on long ocean voyages the density of the water is rapidly raised to a dangerous point. This is, however, entirely overcome by the system adopted in the steamship *Charles Howard*, owned by Messrs. Alfred Stuart & Co., which has recently been fitted with tanks for carrying fine petroleum in bulk and also with Tarbutt's system of burning residual oils under the boilers in place of coal. She is 240 feet in length, with 30 feet beam and 23 feet depth of hold. The whole of the cargo space in the vessel is occupied by tanks for carrying the refined petroleum, while the refuse oil to be used for fuel is carried in the water ballast tanks. Her boiler is of the ordinary marine type, with three flues of 3 feet 6 inches diameter each. These flues are fitted with a brick combustion-chamber and superheater, as in the case of other vessels fitted on the Tarbutt system. Another point of departure in the present instance consists in the substitution of highly heated and compressed air for the steam ordinarily used in liquid fuel fires. The steam used for compressing the air is exhausted into the condenser, the water from which is of course available for feeding the boiler along with that condensed from the main engines. The *Charles Howard* left the Tyne Dock on the 17th ult. for the

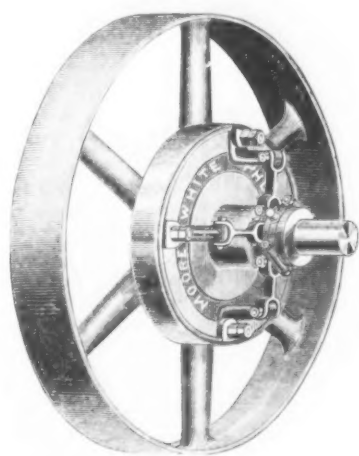


Fig. 1.—General View of Clutch and Pulley.

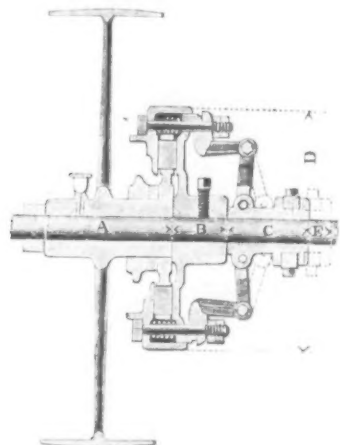


Fig. 2.—Sectional View.

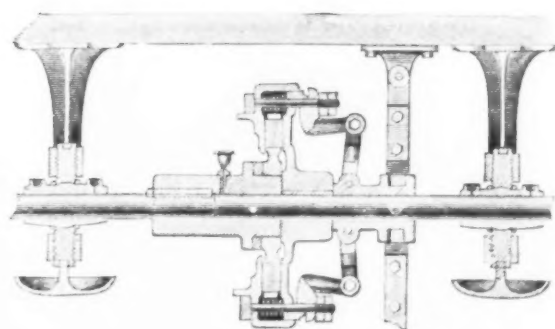


Fig. 3.—Sectional View of Shaft Clutch.

FRICTION CLUTCH, MADE BY MOORE & WHITE, PHILADELPHIA, PA.

will be noticed, is made with a hub such as that on any ordinary loose pulley. Upon this hub is fixed a disk, loosely fitting into the lugs of the clutch proper. The arrangement of this will be readily understood from Figs. 2 and 3. The clutch, being keyed fast, causes the disk to revolve with the pulley, at the same time permitting some end motion which may be made necessary because of the results of wear and tear. The disk presents two friction surfaces of hard wood. Two flat plates or disks clamp the disk by means of levers and toggles. These two disks are separated by means of spiral springs, so as to leave the disk perfectly free. The bolts which connect the two plates are ordinary bolts, and are used to take up the wear when necessary. The sliding sleeve is provided with a thrust collar, made so that any mechanic can apply a suitable lever for operating the clutch. When the latter is thrown in gear no pressure is required to hold it in, as the toggle levers pass a straight line, which causes the sleeve to stay in position until it is again thrown out of gear. These clutches are applied not only to pulleys, but also to many special purposes, and have thus far, we are told, performed very satisfactorily.

Improved Clamp for Molders' Flasks.

The Fairhaven Iron Works, at Fairhaven, Mass., have in use in their foundry an improved clamp for molding flasks, designed by their foreman, David Frawley. Its ar-

range without so great an expenditure of strength. Attention is further directed to the advantage that the peculiar jumping or unsteady motion in the use of the clamping-bar to set in position the old clamp is done away with and a quiet, rolling and steady motion substituted, with no jar and no risk of injury to the mold by falling sand. The destruction of the woodwork on upper surface of the cope is obviated, and no injury can result from melted iron straining out from defective clamping with ordinary clamps. The use of wedges and blocks is entirely avoided. The eccentric is secured to the upper hook or shoulder by a nut and washer, as shown.

Frictional Resistance of Small Cars.

A correspondent of *The Stevens Indicator* writing on the above subject says:

While erecting an inclined tramway it was found necessary to ascertain the frictional resistance of a small car, such as is ordinarily used in foundries and factories for carrying iron and coal. The size of the car and its rather crude design and construction made it questionable as to whether the coefficients of frictional resistance given for larger cars would hold good for the case in hand, and to settle the matter a few tests were made with average results as given herein. For certain reasons it was desired to ascertain definitely the exact strain to which the rope attached to the car was subjected, and the proof that the calculated results approximated

the efficiency of this machine is not affected by the speed at which it runs, it is suitable for being driven by steam, wind or hand power. In small pumps a crank handle is attached to the upper part of the core, and on this a pole with an eye through the center, bushed with metal, is attached, the pole having cross handles at each end. One man works at the handle on the core, and one or more at each of the handles on the pole. It is reckoned that one man can raise in an hour at the rate of 1738 cubic feet of water 1 foot high, the pump making 40 revolutions a minute. If worked by machinery the pump is driven by a spur-wheel at the top geared into a bevel wheel and shaft.

The water level on the inlet side may vary without effecting the efficiency of the pump, except so far as the increased weight is concerned, due to the greater length required to meet the variation. But any change in the level on the delivery side immediately effects the efficiency. These

cent. of the power applied. The Dutch screw pumps are constructed to work without an external casing, the wheel revolving in a semi-cylindrical trough of masonry. The weight of the water is thus borne on the masonry, and the screw is relieved of the strain. An example of one of these pumps is given in the annexed engraving.

Mr. W. Airy, in a paper contributed to the "Transactions" of the Institution of Civil Engineers in 1871 (Vol. xxxii.) gives the results of experiments carried out by him to test the relative merits of screw pumps of different construction. The results he arrived at were—1. That the smaller the spiral angle, i. e., the quicker the spiral, the flatter must the machine be laid to the horizon to produce its best effect. 2. That in an equal number of revolutions the quicker spirals will lift much more water than the slower ones. 3. That there is a great difference in the effect of the machines according as one end or the other is upward. The advantage is greatly in favor of the machine when placed so that the acute angle which the thread makes with the core is downward.

With regard to the number of threads, Mr. Airy is of opinion that every machine should have as many threads as the conditions of ordinary workmanship and convenience will allow. That for screws of any size, say six feet or seven feet external diameter, the width of the chamber should not be less than 18 inches on the square, and the diameter of the core one-third nearly of the external diameter. These conditions allow four threads for a screw, whose spiral angle varies between 20° or 30°, three threads between 40° and 50°, two threads for 60°. The threads of the screws of the pumps upon which he experimented, and which he considered was the proper form to use, were made developable, by which term he meant a curved surface that would be unwrapped, laid flat, and inside a plane. The surface of the spiral thread, as ordinarily used, lying at right angles to the surface of the core, and such that if laid out flat the external edges would have more surface than the inner. Screws developed from a flat plate hold more water than those having threads at right angles to the surface of the core, and are easier to construct. The effect of the internal frictional resistance with a pump three feet in diameter, 10 feet lift, and running at 20 revolutions a minute, he found to vary from four and a half to eight per cent. of the useful effect realized. The gudgeons being 4 inches in diameter absorbed 12 per cent. of the power applied. The best machines give off a useful effect of 75 per cent. of the power applied. For the most economical machine he considered that the spiral angle should not be less than 30° nor greater than 40°, and that the limit of height at which these pumps can be worked advantageously is 10 feet.

Black Sea, and as she steamed down the river at full speed not a particle of smoke was visible from the funnel, the fire working admirably from the first start. It is stated that the owners propose to fit the remainder of their fleet with similar apparatus. The storage of the oil in the water-ballast tanks has, we believe, never before been introduced in practice. It is an important feature, as it saves the shipowner the heavy expenditure incidental to the fitting of tanks in the bunker spaces, and, combined with the substitution of air for steam, makes a decided departure in liquid fuel practice.

Marine Engine Economy.

An interesting example of the comparative economy of the old and more modern styles of oscillating marine engines was lately furnished by an instance quoted by Mr. J. W. T. Harvey, before the engineering section of the Bristol Naturalists' Society, England. The *Juno* was originally worked with a jet condenser; after a time this was replaced by a surface condenser, and finally the engines were compounded. Thus we have the same vessel working under three different conditions, and any alteration of coal consumption must be due to the changes in her machinery. The engines originally worked at 30 pounds per square inch and indicated 16½ horse power; they drove the vessel at 14½ knots, using 32 tons of coal per voyage. Subsequently new boilers and a surface condenser were fitted to the ship, the pressure still being 30 pounds; the same horse power and speed were then maintained with a consumption of 24½ tons of coal per voyage, a saving of 7½ tons or 23 per cent. As competition in the carrying trade became keener, this coal consumption could not be afforded, and it was determined to compound the engines as inexpensively as possible. One of the existing 16½ inch cylinders was replaced by another of 40 inches in diameter, and this together with two sets of link motion, two feed pumps, a steam starting engine and a pair of cylindrical boilers working at 50 pounds pressure, constituted the whole of the new parts. The engines now gave 1270 horse power or 33½ horse power less than before, and drove the ship at 13½ knots, or 0.7 knots slower, on a consumption of 19 tons of coal per voyage. The coal consumption per horse power therefore varied under the three conditions as 160 to 177 to 157. The consumption per voyage varied as 160 to 157 to 133.

A new electric launch is being built by an English firm. She will measure 90 feet in length and has 11½ feet of beam. Accumulators will furnish power, but instead of charging these on shore before the voyage, she will carry her own dynamo. The dimensions of the vessel will admit of this new departure.

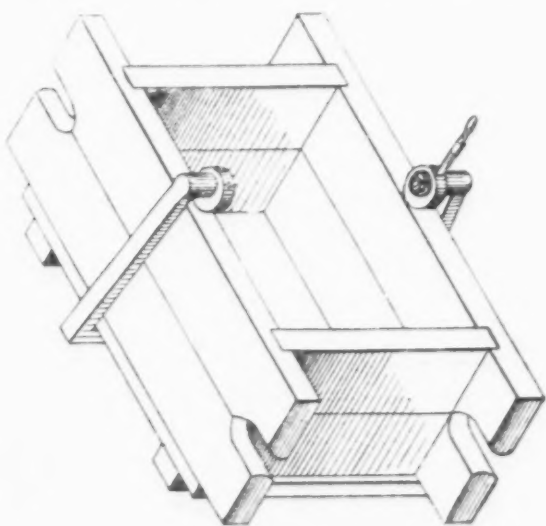


Fig. 1.—General View.

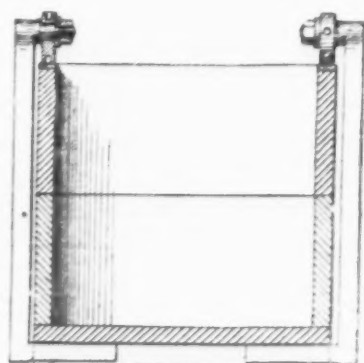


Fig. 2.—Section of Flask with Clamp Adjusted.

FRAWLEY'S IMPROVED CLAMP FOR MOLDERS' FLASKS.

angement will be readily understood from the engravings which we annex. The device, it will be noticed, is extremely simple, consisting essentially of a bar having a hook or shoulder at one end and a small eccentric at the other. This eccentric is adapted to be rotated by a handle bar, which can be inserted in either of a series of holes arranged radially in the periphery of the eccentric. The latter can be firmly secured in its position by simply chocking with a nail or a rap of iron, the handle bar being removed.

The clamp has been used with very good results in a great variety of work. It is claimed that it clamps much more effectively than the old style clamp, securing a firmer

very closely to the actual conditions in practice was exemplified by the fact that a load slightly in excess of what was intended to be put on the car showed itself very apparently in the operating mechanism as desired. The car had two pairs of coupled wheels, each wheel being 7¼ inches in diameter, and securely fastened to an axle which was 1¼ inches in diameter at the journal. The boxes were 2¼ inches long. The track was spaced 24 inches between inside edges. The car at the time of the tests was loaded with 4000 pounds of pig iron, and the car itself weighed 272 pounds, making a total weight of 4272 pounds. The average results obtained were as follows, ordinary track, dry and in fair order: To

pumps are not there're adapted for use where there is much change in the level of the water into which they discharge. The angle which the pump forms with the horizon when fixed varies according to the ideas of different constructors, but generally it may be taken that the most efficient position for the pump is when the angle of tilt is rather less than the spiral angle. Thus, for a machine having a spiral angle of 40° the angle of tilt for the pump should be 30°. The spiral angle is the form which the screw assumes with reference to the core, and is the angle made by a tangent drawn to the spiral on the cylindrical core, and a vertical line parallel to the axis of the cylinder. This angle varies from 30° to

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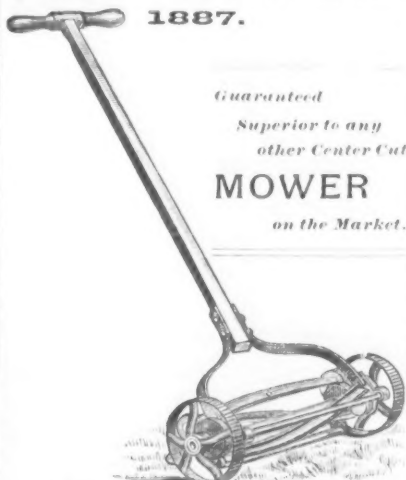
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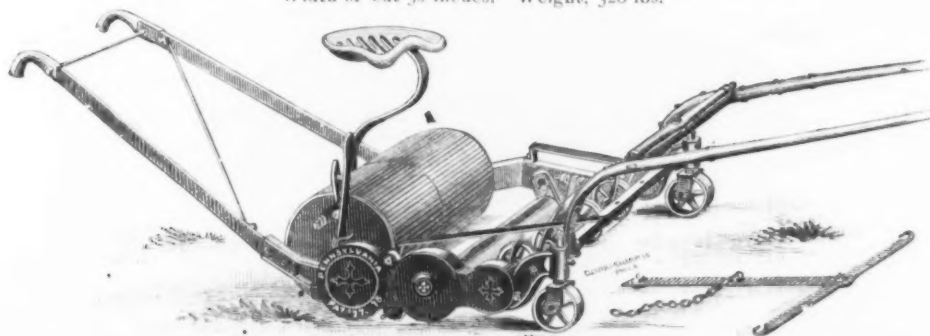
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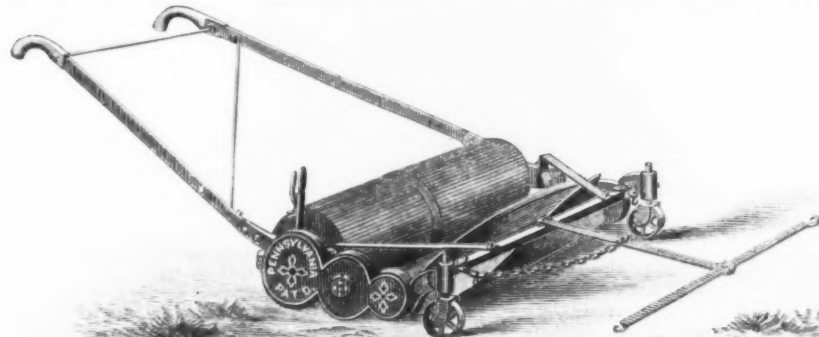
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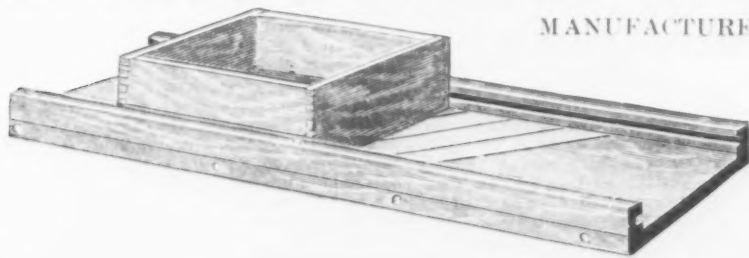
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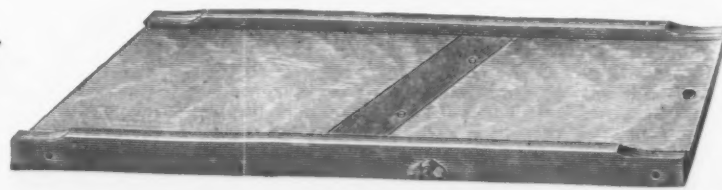
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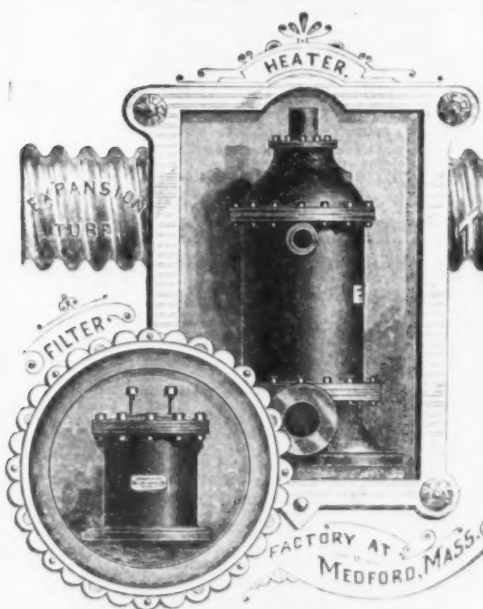
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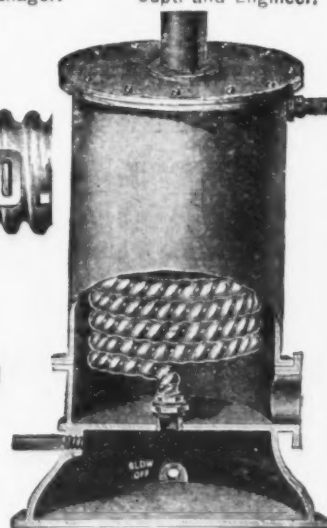
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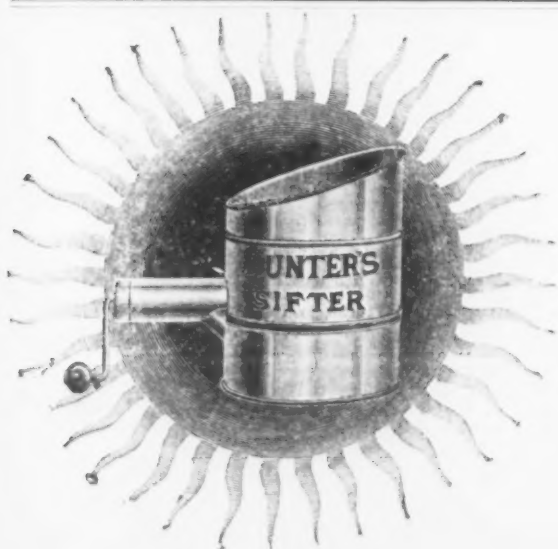
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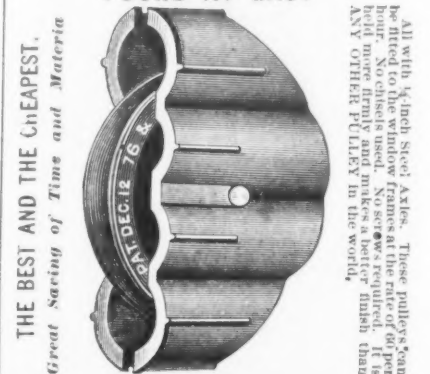
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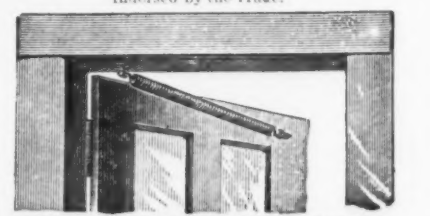
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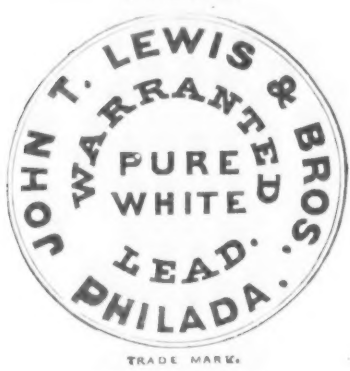
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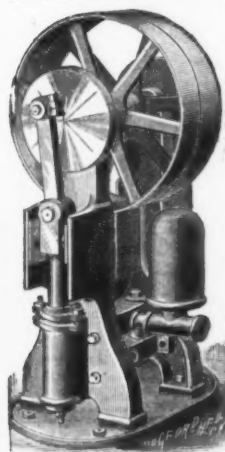


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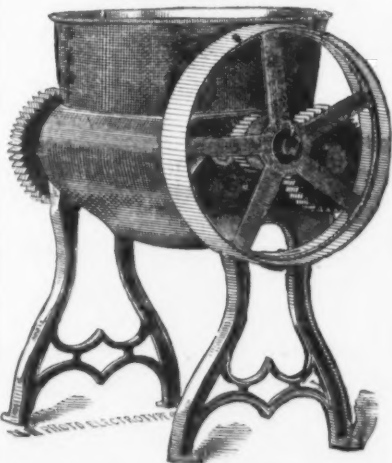


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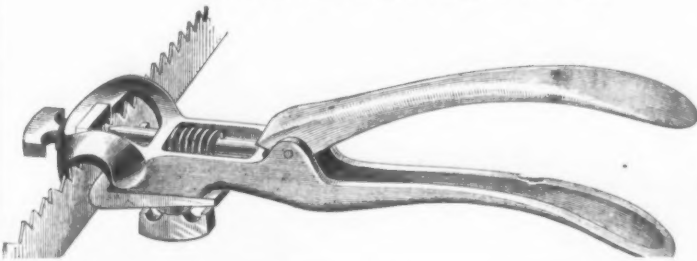
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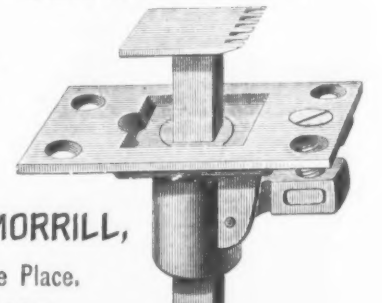
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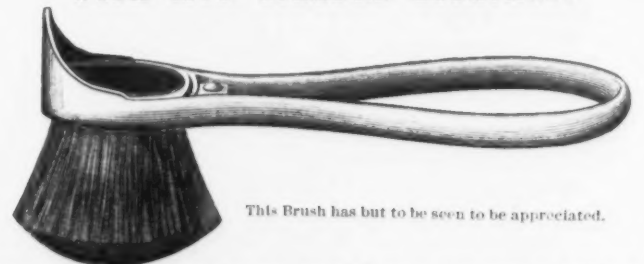
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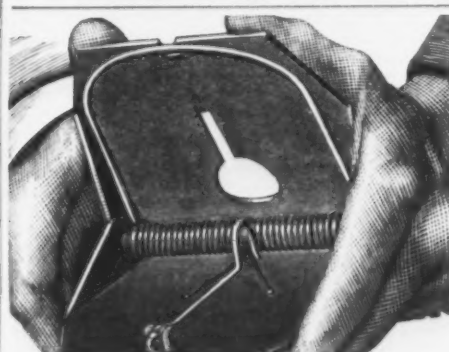
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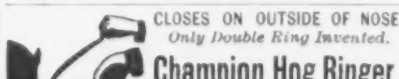


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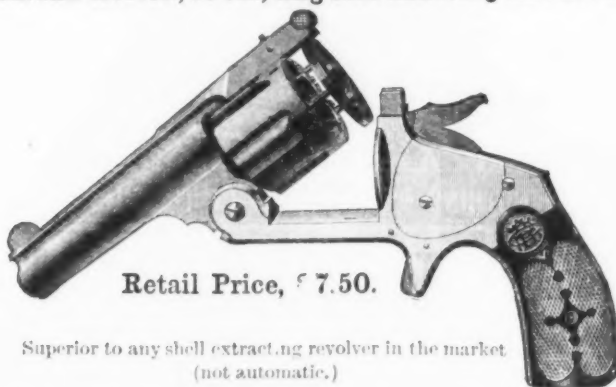
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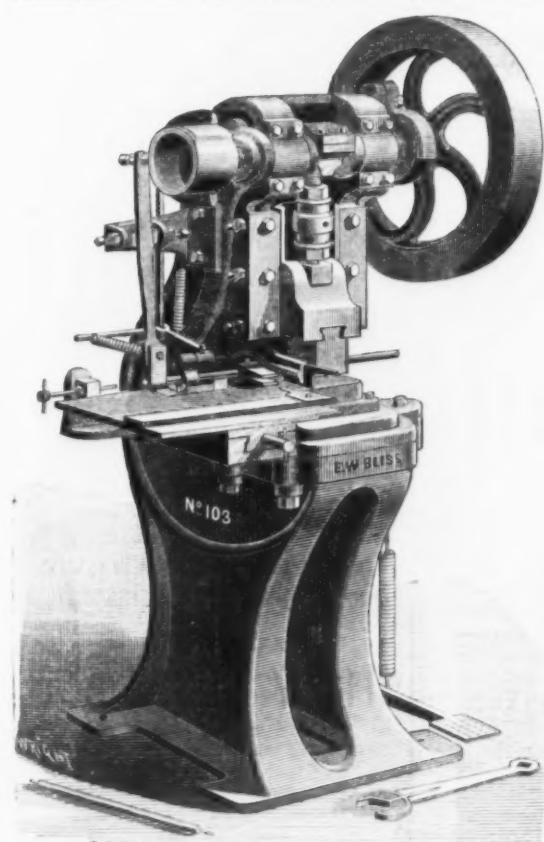
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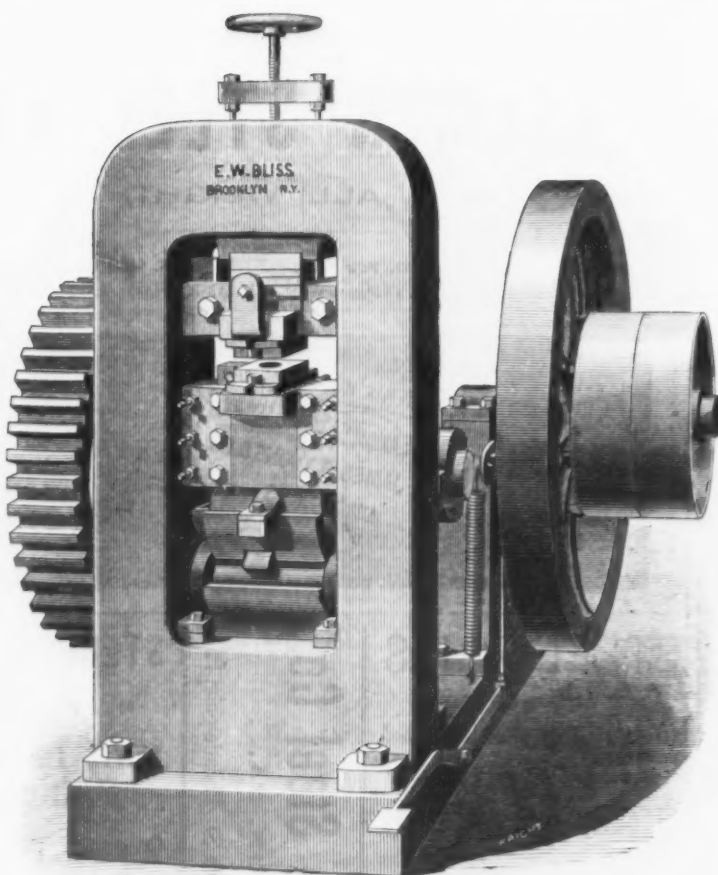


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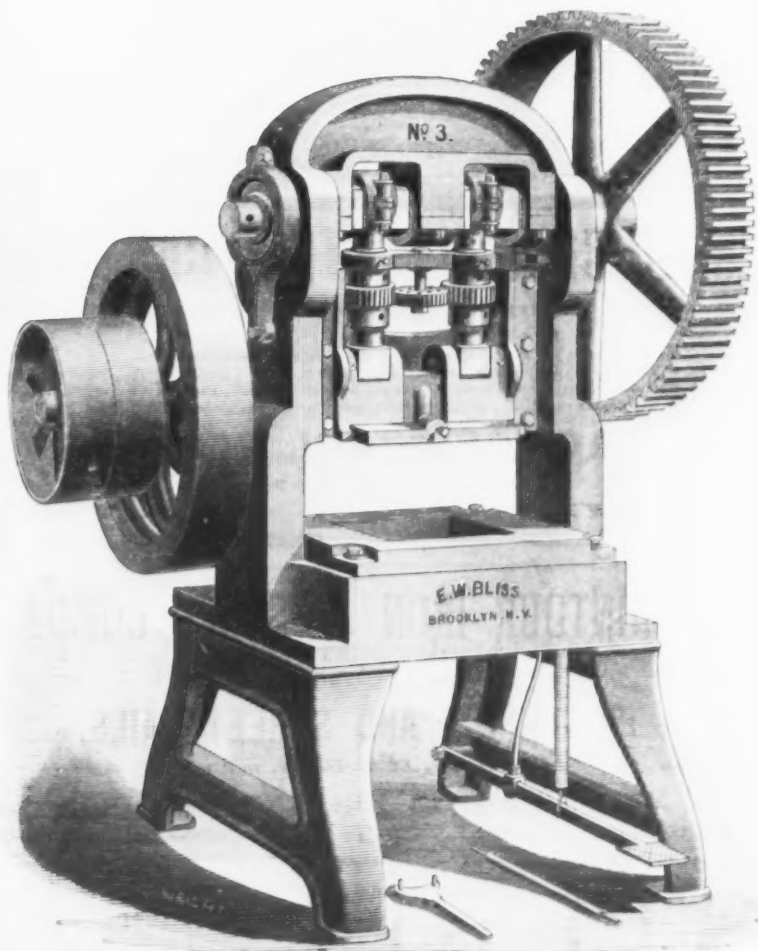
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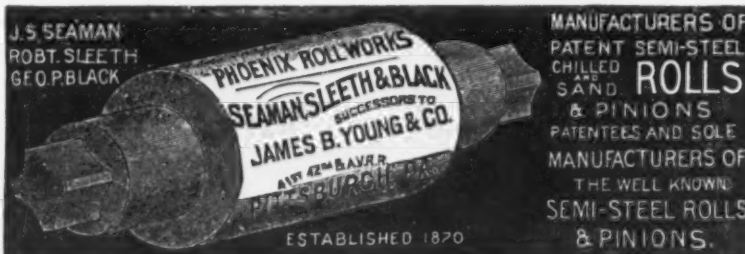
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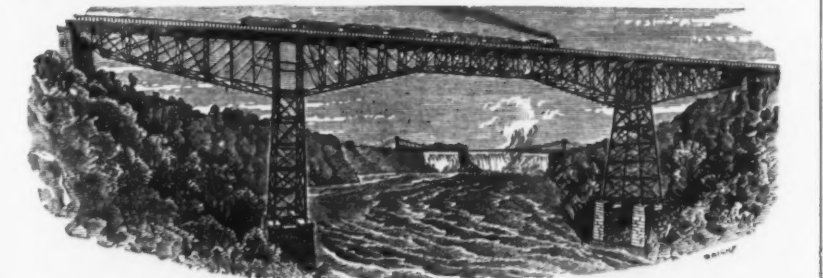
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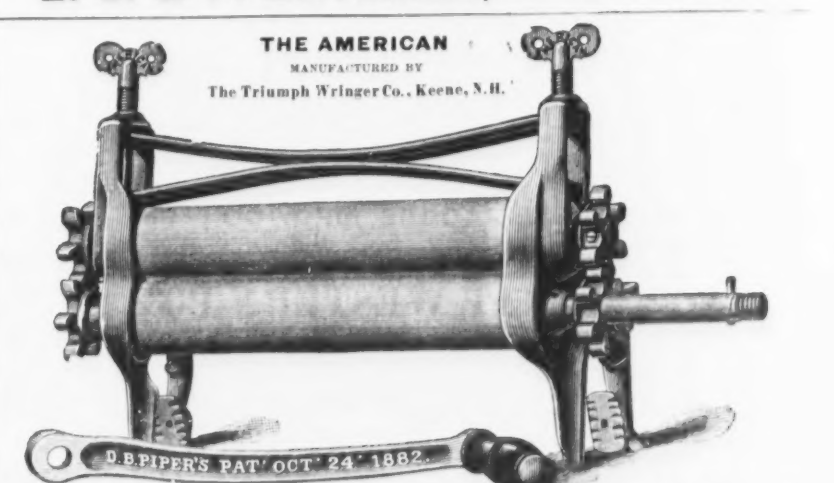
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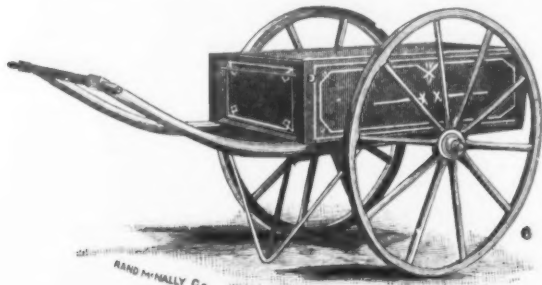
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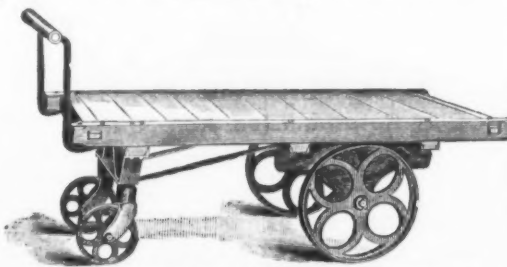
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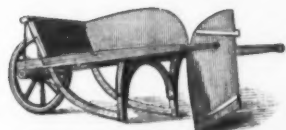


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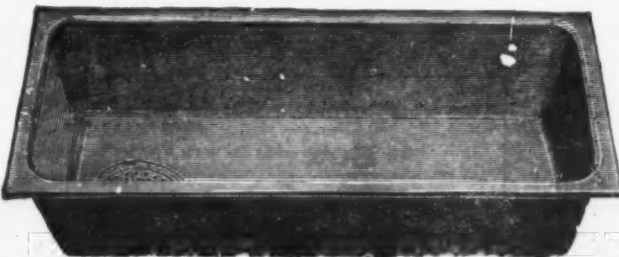
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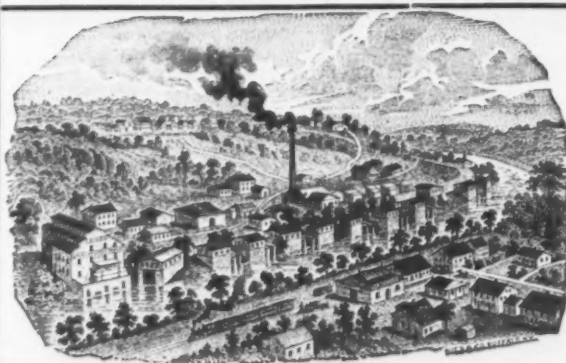


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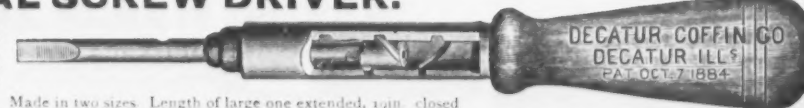
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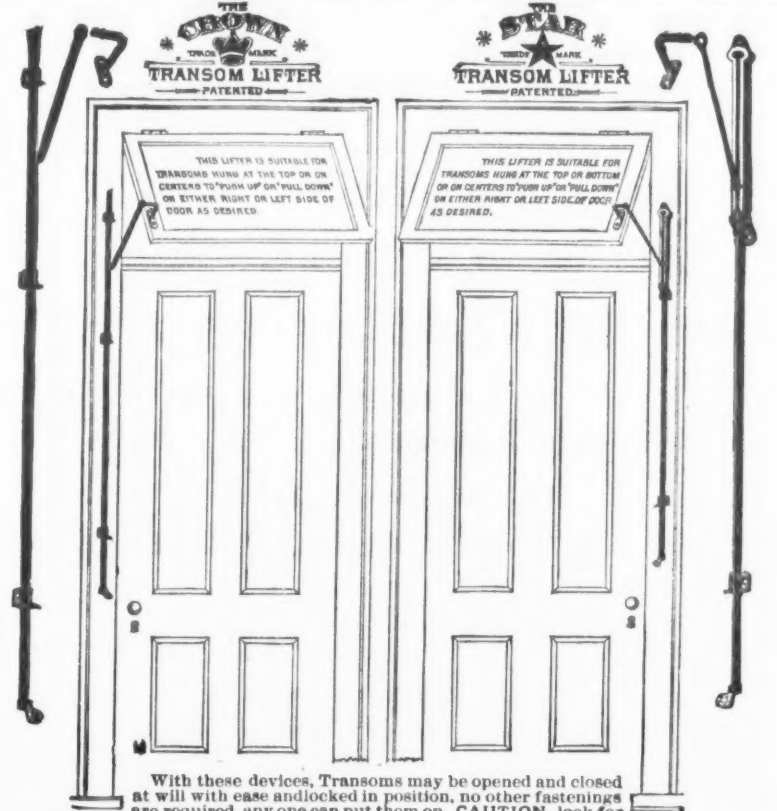
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44	4 "	" "	" "	0.65		84	4 "	" "	" "	0.80				
45	5 "	" "	" "	0.75		85	5 "	" "	" "	0.90				
46	6 "	" "	" "	1.15		86	6 "	" "	" "	2.00				
47	7 "	" "	" "	2.00		87	7 "	" "	" "	2.25				
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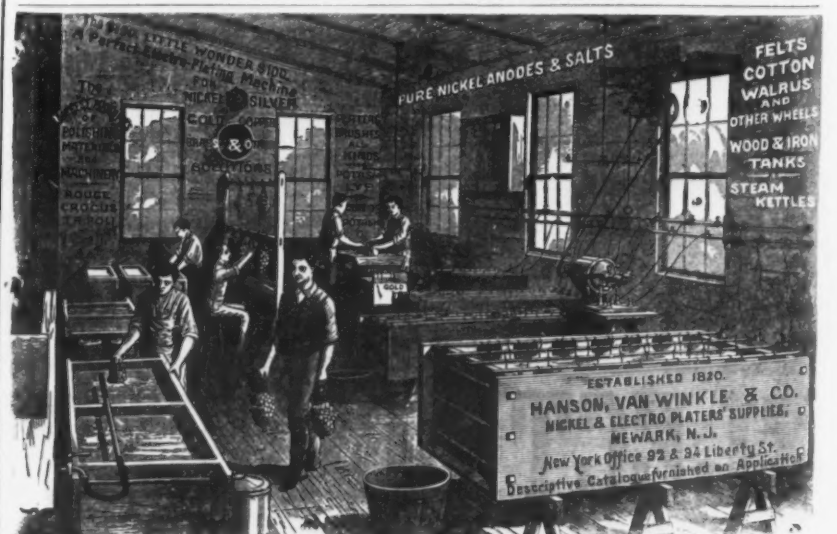
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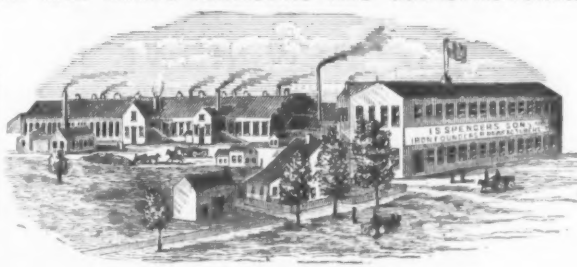
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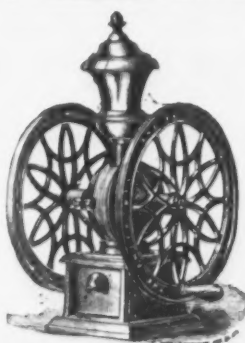
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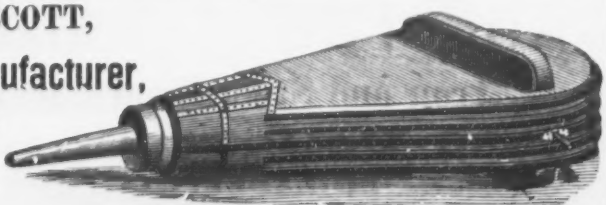
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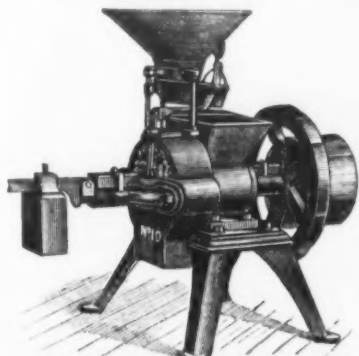
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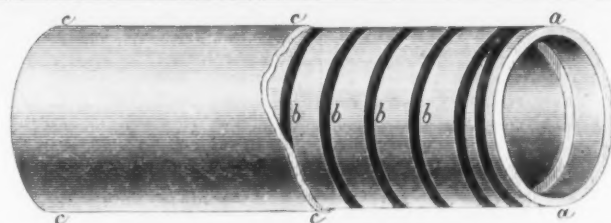
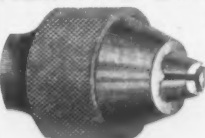
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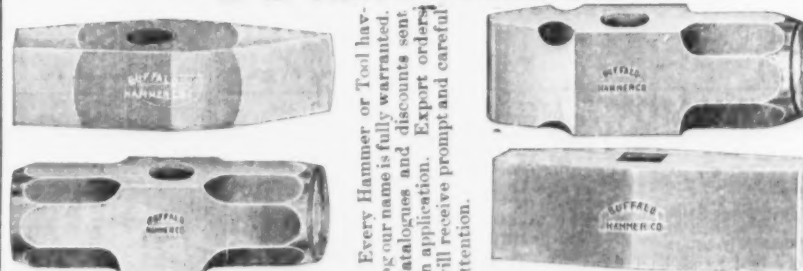
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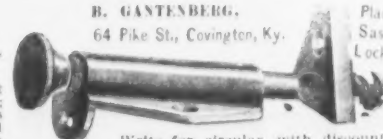
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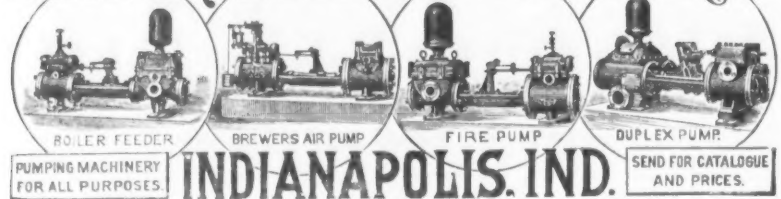
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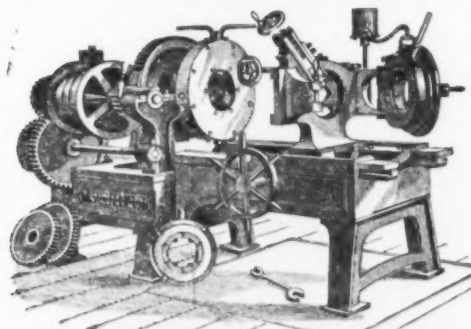
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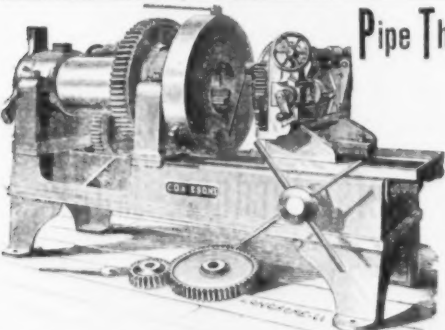
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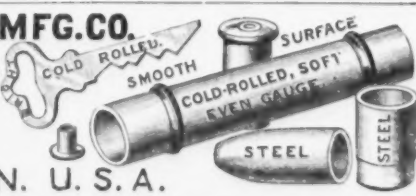
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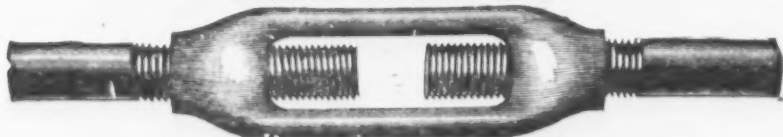
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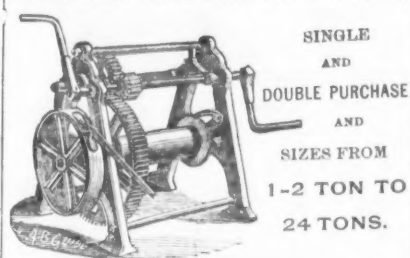


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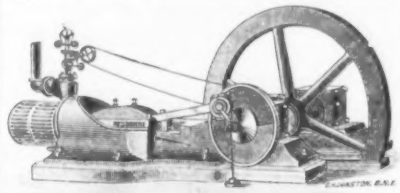


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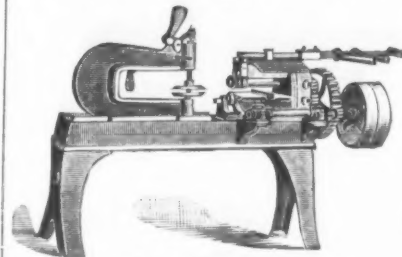
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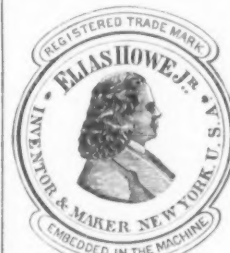
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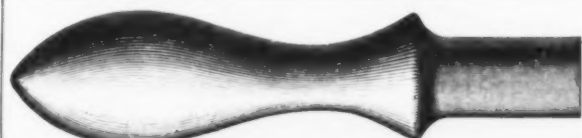
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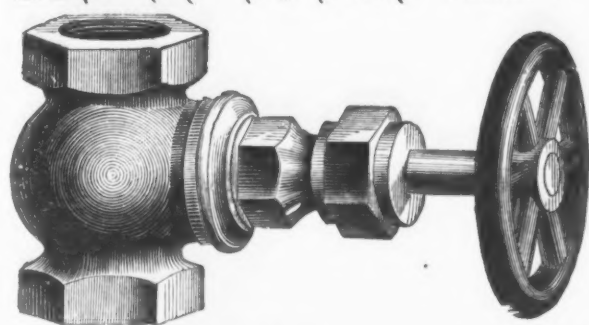
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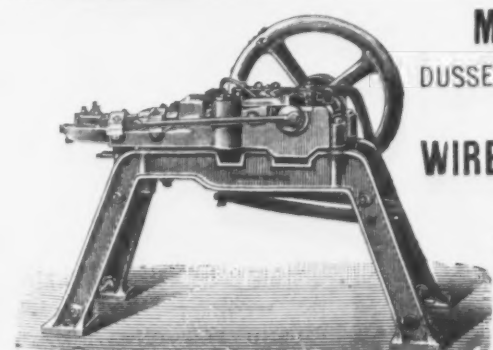
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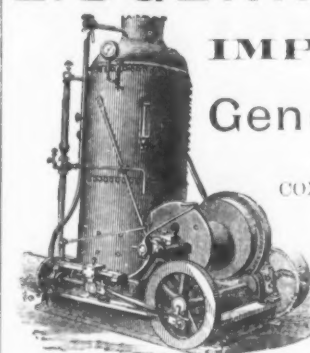
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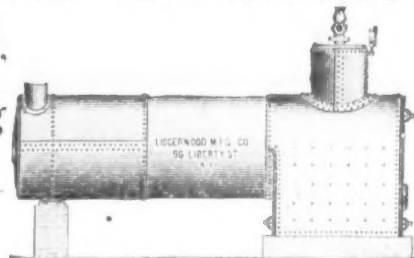
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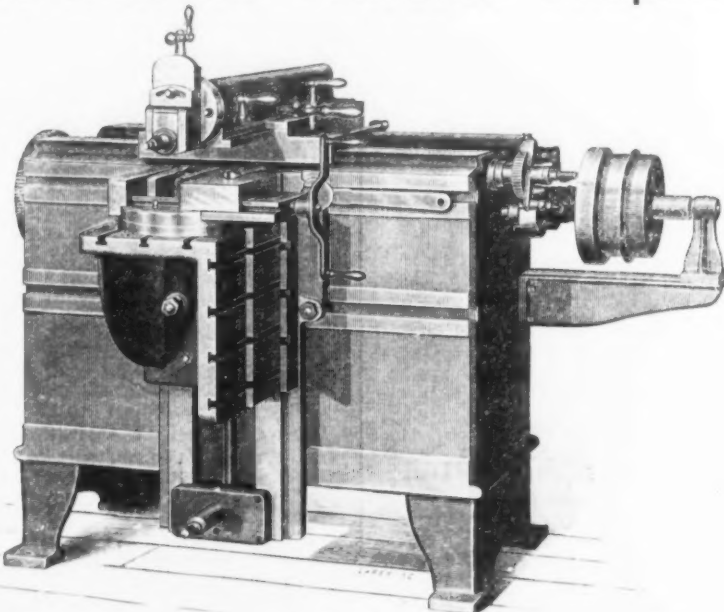
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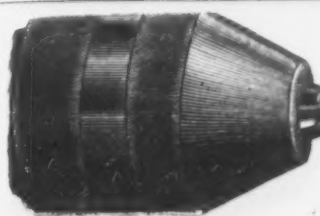


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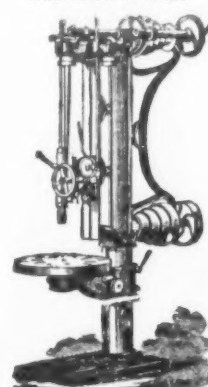
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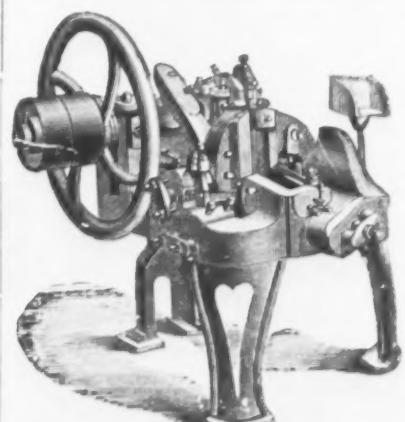


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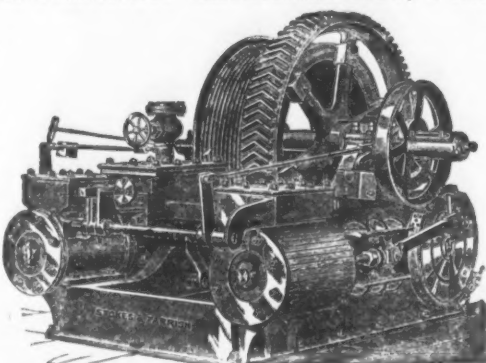
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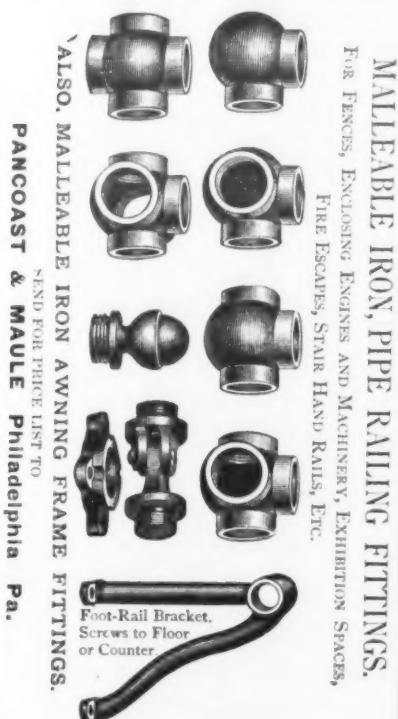
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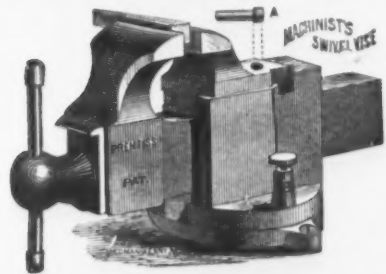
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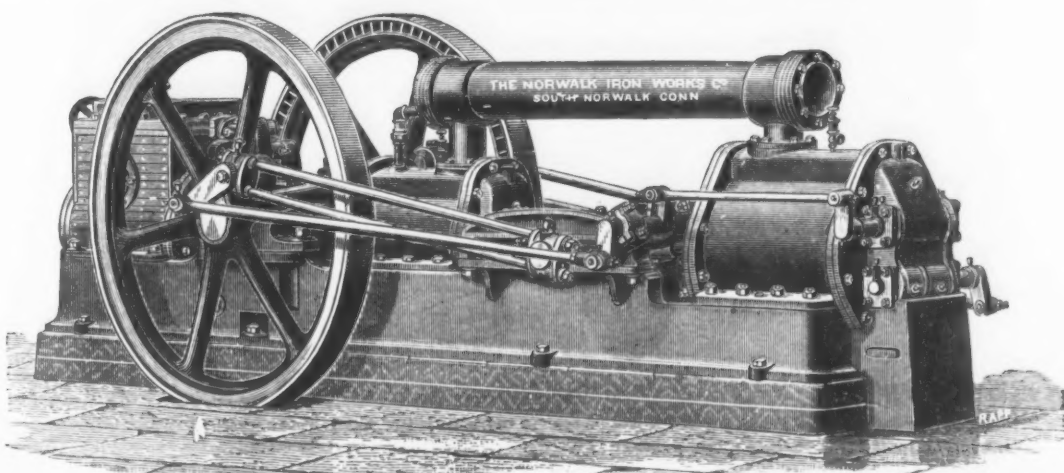
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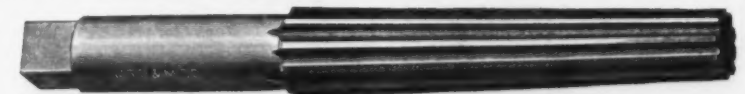
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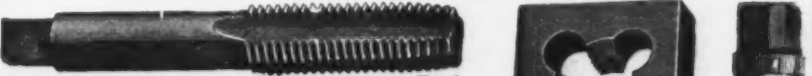
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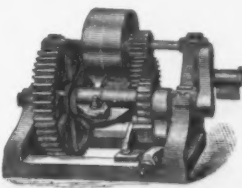


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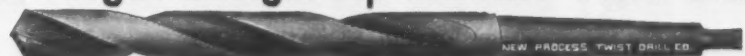
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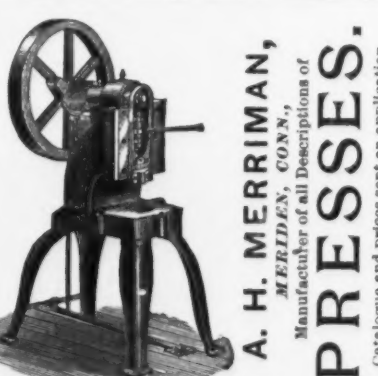


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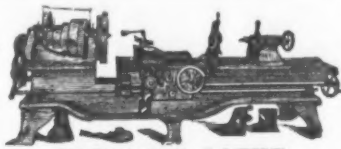
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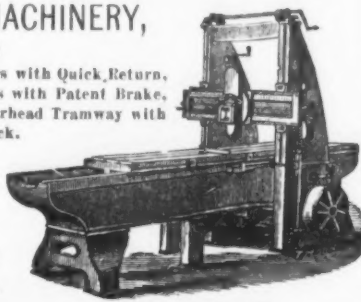
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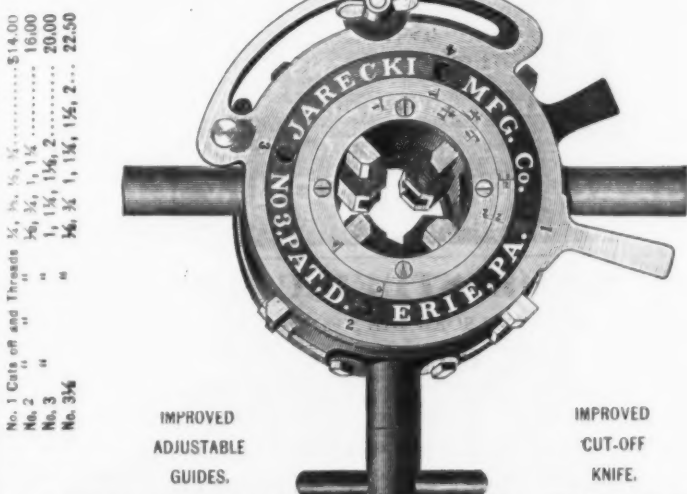
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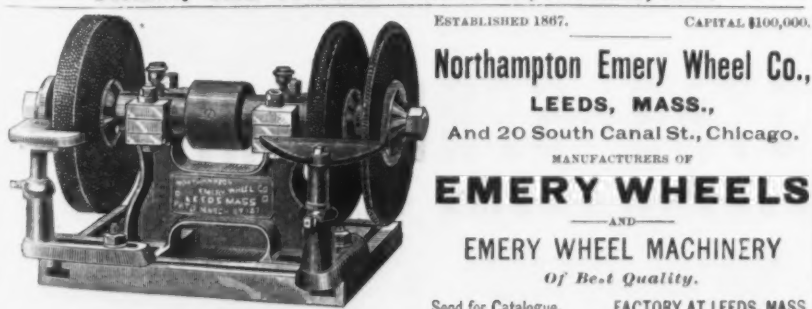


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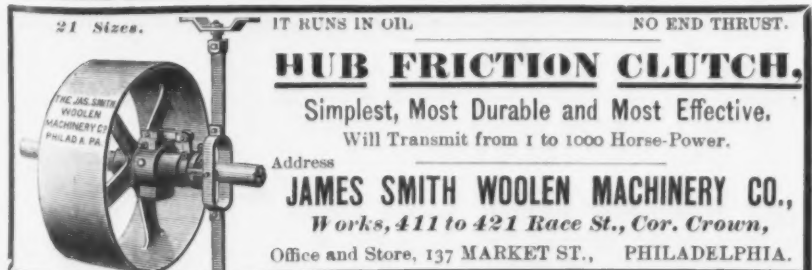
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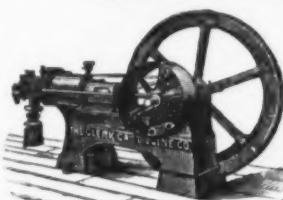
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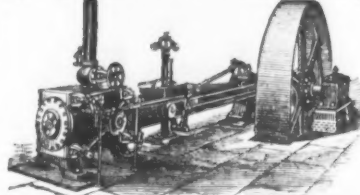
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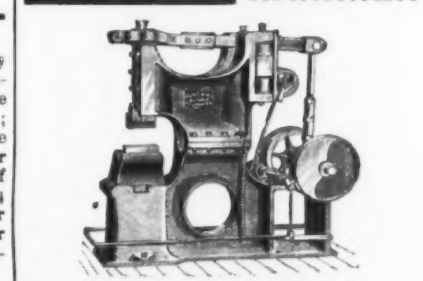
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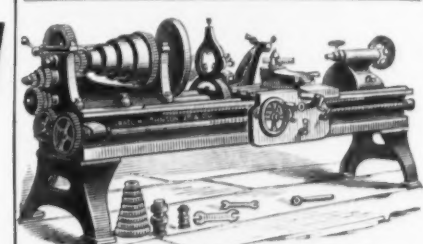
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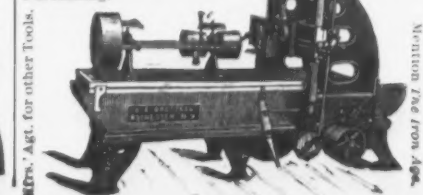
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